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1913

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STATE OF NEW YORK

SECOND ANNUAL REPORT

OF THE

CONSERVATION COMMISSION

1912

DIVISIONS OF LANDS AND FORESTS
AND FISH AND GAME

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SECOND ANNUAL REPORT

OF THE

CONSERVATION COMMISSION

ALBANY, N. Y., *Jan.* 15, 1913.

HON. MARTIN H. GLYNN, *Lieutenant-Governor and President of the Senate:*

Herewith in pursuance to law we transmit to you the annual report of the Conservation Commission for the fiscal year ending September 30, 1912.

Respectfully yours,
CONSERVATION COMMISSION,
By GEORGE E. VAN KENNEN,
Chairman.

STATE OF NEW YORK

CONSERVATION COMMISSION

George E. Van Kennen, Ogdensburg.....
James W. Fleming, Troy..... } *Commissioners*
John D. Moore, New York.....

Charles H. Jackson, Albany.....
Thomas H. Guy, Troy..... } *Deputy Commissioners*
James J. Fox, Brooklyn.....

Albert E. Hoyt, Albany.....*Secretary to Commission*
John J. Farrell, Troy.....*Assistant Secretary*
Eugene Lamb Richards, Jr., New York, *Counsel to Commission*
George P. Decker, Rochester.....*Assistant Counsel*
Richard W. Sherman, Utica.....*Chief Engineer*
M. H. Hoover, Lockport.....*Chief of Publication*

SECOND ANNUAL REPORT

OF THE

CONSERVATION COMMISSION

1912

TRANSMITTED TO THE LEGISLATURE JANUARY 15, 1913

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SECOND ANNUAL REPORT

OF THE

CONSERVATION COMMISSION

To the Legislature:

We take pleasure in submitting this annual report, which while numerically our second, is the first report covering a full year's activities of the Conservation Commission, under the Conservation Law.

The intent of its framers, that there should be consolidated into the Conservation Law all laws relating to lands and forests, and fish and game, has now been complied with. The new codification covering these features of the commission's work has been in operation for some months, and has proved, in the main, satisfactory. There yet remains to be enacted conservation legislation covering the all important problem of development and utilization of the State's water resources. No question of graver moment will come before this or any other Legislature of our time.

CONSERVATION OF WATER FOR POWER PURPOSES.

Those familiar with the movement in New York for the conservation of water for power purposes must recognize the fiscal year ending September 30, 1912, as an epoch making period. The attitude assumed by the Governor, the hearings and report of the Joint Committee of the Legislature on the conservation of water, the hearings before the Judiciary Committee of the Senate on the various bills presented, the debates in the Legislature, the formulation by the Commission of its policy of State development and distribution of power and its announcement and explanation before various official and civic bodies, the unanimous endorsement of the Commission's policy at the Utica meeting of the Mayors of New York and by the State Federation of Labor, have all concentrated attention upon the subject and served to educate the

public as to the facts and issues involved. As to the principal ends that should be achieved there is practical unanimity of opinion among those having in view the best interests of the State. As to the methods to be pursued to reach those ends, there is a wide diversity of opinion. As to the foundation facts, they are well covered in a general way by the following excerpt from the Report of the Joint Committee of the Legislature on the Conservation of Water (p. 9):

> "The transmutation of water power into electrical power widens at a single stroke the area of its possible utilization. As a result of this possible transmutation the beneficial effects of falling water are confined no longer to the ribbons of territory running alongside the streams.
>
> "Developments in the transmutation of electrical current have vastly enlarged the theatre of its power. No longer is the riparian owner the only possible user of the energy of the stream. Within a radius of a hundred miles of the channeled tide any manufacturer, any municipality, any person or corporation whose business depends upon the use of power, may be a beneficiary of its translated energy. The force of Niagara Falls is being transmitted to and being utilized in Syracuse, one hundred and fifty miles away.

THE CONCERN OF THE STATE.

> "This sudden and vast diffusion of power changes at once the light in which it must be considered. It has ceased to be local as to situation or private as to persons using it. It becomes state wide and public in its nature, rising in importance from a mere commercial to a pressing and important governmental question. Hydro-electric energy is the factor that has effected this change, that has made the development of water power a state wide issue. It affects now not merely a fraction of our population but our whole population. At the same time that these political considerations project it into the sphere of State control, the physical proportions of the problem assume dimensions of such magnitude and nature that nothing less than the State can adequately deal with it. Individually developed power has reached its limitations. The natural laws of commerce bar further progress under impulses purely commercial. Riparian owners along the various streams have invested millions in the development of water power, but this development has now reached the point of maximum commercial practicability. Beyond this point the commercial impulse will not drive.

"In another aspect also the limit of development by commercial interests has been accomplished. Human skill has contrived no shackle which will control the giant in the fullness of his strength. There is no commercially practicable mechanism that will adjust itself to the fluctuations of the driving force of spring floods at the point of application. Much must be wasted and much expended in the wild rush that fills the valleys with ruin, and does incalculable damage to the villages and towns. Then comes the summer drought and the wheels are motionless for lack of that power so lamentably wasted, so injuriously expended a few months before. It is not at the point of transmutation into useful energy, but at its head waters that the stream can be controlled, and private owners of riparian rights cannot reach the source of the streams they use. Conditions of a commercial, a physical and political nature tie their hands. Individuals as such could not agree as to the details of the necessary improvements, nor could they agree as to the proportion of expense to be borne, and beyond that they lack the sovereign right of eminent domain necessary to accomplish the object in view.

"Your committee believes, therefore, that all citizens will agree that the time has come when the State as such should undertake these vast improvements, that the sovereign power may be exercised for the common good in the execution of a task beyond the strength of any power less than sovereign."

Up to this point there is unanimity of opinion; beyond it there is divergence in several different directions.

There is at the present time in the State of New York approximately 1,500,000 unutilized horse-power, going to waste every year; and of this vast amount of unproductive energy, approximately 400,000 horse-power is absolutely owned by the State, of which nearly 100,000 horse-power is created by the construction of the canal system of the State.

THE COMMISSION'S POLICY.

The policy formulated and advocated by the Conservation Commission for the conservation of the water powers of the State, while recognizing that the previous State policy of the storage of the flood waters of the stream for the benefit of the lower riparian owners, for which benefits they should pay a revenue to the State,

is a just policy, regards that former policy as only a comparatively minor feature of a much broader one. Under the present policy brought forward by the Commission, the unused waters of the State are to be developed both by storage of flood waters and construction of plants at new sites, and the resulting energy transmitted throughout the State. Physically, the project contemplates the ultimate construction of a grand system of electric transmission covering the State by main trunk lines, with branches radiating to all points, from sub-stations located at convenient places on the main trunk system. Power is to be supplied to this system primarily by the utilization of the undeveloped water powers of the State.

The various municipalities of the State are to be furnished this power under contract with the State at a price sufficient to cover costs of production and transmission, including interest and sinking fund charges on the bonds of the State issued for the construction costs. The power is to be used by the municipalities for all municipal purposes, such as lighting their streets and public buildings, pumping city water supplies, and for supplying light, heat and power at cost to all the inhabitants. With this brief description of the proposed plan, we pass to a consideration of the reasons why it is advocated by the Commission.

LEGAL ADVANTAGES.

As has been repeatedly pointed out heretofore all procedure or proposed procedure for storing the flood waters of our streams has had to rest upon a palpable subterfuge, viz., that the proposed reservoirs are being constructed for the benefit of public health and safety, whereas the main purpose is increasing the power at sites below. In all the large projects it will be necessary to exercise the power of eminent domain, and the subterfuge was necessary in order to escape the implied provision of our fundamental law prohibiting the taking of private property for a private purpose.

Various other expedients for practical evasion of this constitutional inhibition have been proposed. The Commission holds that the only way to make the purpose a public purpose is to make the benefits accessible to the entire public. The development of power by the State at the storage dams or at points on the stream below,

and the use of that power in lighting the public streets, highways, and buildings, and for other municipal purposes, and for light and power for all, is a project having the public purpose clearly and unequivocally involved, and could sustain, successfully, the power of eminent domain.

It is believed that the Commission's plan follows the only way that is now open through the many legal difficulties. Other methods require amendments to the State Constitution that are themselves of doubtful constitutionality when referred to the federal constitution.

ECONOMIC ADVANTAGES OF THE COMMISSION'S PLAN.

In the opinion of the Commission there are two prime objects to be secured in handling the water powers of the State, and only two that are of sufficient dignity and worth to merit action by the State. The first is to advance the economic welfare of our people as a whole, and the second is to insure that the new opportunities created and benefits conferred shall be and remain open to every citizen. These objects will be attained by placing at the disposal of all our citizens power in quantities limited only by their requirements and at the lowest price consistent with self-supporting operation. The plan of the Commission is virtually to bring into use with the least possible loss of time the now wasting but wonderfully abundant water powers of the State by bringing them to market; to the doors of our farmers, merchants and manufacturers, and alongside the cheap transportation and labor markets, thus offering a premium to commercial expansion by enabling our people to produce more cheaply and live more cheaply and comfortably. The Commission believes that this plan will effect industrial expansion without industrial revolution.

It is expected that in carrying out the plans of the Commission no storage reservoirs will be built until a sufficient number of the lower riparian owners have joined in an agreement with the State, under the terms of which the State will be assured a revenue commensurate with the benefits conferred. Any legislation should give the Commission means of dealing with any owners inclined to be unfair. If deemed sufficiently important, the power from the stored water can be utilized by the State, the owners' rights therein

and a site for development being made subject to acquirement by eminent domain. It is not the intention, however, to disturb any private enterprise that is in good faith utilizing the power owned by it, but it is intended to prevent the holding of powers for speculative purposes and to prevent high prices for power being brought about and maintained by an artificial restriction of supply. The enormous quantity of undeveloped power now owned by the State will make it unnecessary to acquire more by condemnation or purchase for many years to come.

Local Sources of Power in the Capital District.

PLACE.	Head.	ECONOMIC CAPACITY OF HYDRAULIC DEVELOPMENT, H. P.		Capacity of auxiliary H. P.	ECONOMIC PEAK LOAD CAPACITY, H. P.		COST PER H. P. PER YEAR DELIVERED.		Existing Developments.	Distance from Albany.	Distance from Troy.	Distance from Schenectady.	Stream.
		Without auxiliary.	With auxiliary.		Without auxiliary.	With auxiliary.	Without auxiliary.	With auxiliary.					
	Feet.									*Miles.*	*Miles.*	*Miles.*	
Vischer's Ferry	*30	6,000	12,000	8,000	6,000	17,500	$6 88	$6 72	.....	12.00	13.50	5.00	Mohawk River
Crescent	30	6,000	12,000	8,000	6,000	17,500	6 88	6 72	.....	11.60	6.25	13.25	Mohawk River
Waterford	14	3,800	7,600	7,000	3,800	12,600	7 30	9 22	.....	13.00	6.50	16.00	Hudson River
Troy	13	6,000	12,000	10,000	6,000	20,000	.....	.....	2,450	6.50	0.00	19.50	Hudson River
Total	.....	21,800	43,600	33,000	21,800	67,600	.....	.....	.....	.....	.....	....	.....

*With 3 feet flashboards.

FINANCING THE COMMISSION'S PLAN.

While, as previously stated, the plan of the Commission contemplates the *ultimate* construction of a complete system of power plants and hydro-electric primary and secondary transmission lines covering the State, the Commission considers the completed scheme as an end that will be reached by growth from small beginnings, a supply being furnished only when called for by a sufficient number of the municipalities of any group, but each step will be so taken as to fit into the final system. The system is so planned that construction by stages will entail an ultimate capital investment but little, if any, greater than would be required by construction of the entire system at once.

From the foregoing it will be clear that while the ultimate investment will be large only a very small investment will be necessary to initiate the plan, test its various features and remedy any defects that practical operation may disclose. Bearing in mind that the entire expense will ultimately be reimbursed to the State, it will be appreciated that the feature of construction by stages is one of great advantage.

POWER DEVELOPMENT FOR THE CAPITAL DISTRICT.

For example, there is an exceptional opportunity for the production of cheap power in the vicinity of the populous district comprising the cities of Albany, Troy, Schenectady, Cohoes, Watervliet and Rensselaer and the smaller adjacent municipalities, popularly known as the Capital District. The engineering corps of the Commission has prepared preliminary plans in detail for generating and transmitting power in this district. The accompanying map shows the area to be served, and the table the available local undeveloped powers.

It appears that:

1. The construction of the Barge canal will create near the center of the Capital District four large powers from which energy can be delivered to sub-stations in Albany, Schenectady, Troy, Cohoes and the other municipalities of the district at a price astonishingly cheap. The heavy capital costs of dams and controlling works have already been incurred by the State in the

construction of the Barge canal. Thus the project is free from the heaviest of the charges for hydraulic development, and the price for a peak load of 35,000 H. P. will not exceed $10 per H. P. per year.

2. The amount of power is ample to supply the growth of demand in the district for a long time to come.

3. As the first stage of the development, 6,000 H. P. of hydraulic machinery may be installed at Crescent, and a similar equipment at Vischer's Ferry, with transmission lines which will deliver to the cities of the district an aggregate peak load of 10,600 H. P. for a total capital investment of about $625,000.

Investigation shows that this plan will not require any issue of State bonds.

The Commission recommends that a law be passed authorizing the construction of the Capital District Project and prescribing the conditions for construction, operation and sale, and making an appropriation therefor.

INVESTIGATION OF HYDRO-ELECTRIC POWER-DISTRIBUTION IN THE PROVINCE OF ONTARIO.

A concrete example of the practicability of the policy advocated by this Commission is shown by the work of the Hydro-Electric Power Commission of the Province of Ontario. The demonstration is of the greater value because of the fact that it has been carried out under conditions almost identical with our own.

The Conservation Commission has, therefore, observed the work of the Ontario Hydro-Electric Power Commission with more than passing interest, and the Commission and its officers have visited the Province of Ontario on various occasions and have gathered a great amount of valuable data.

ORIGIN OF THE MOVEMENT FOR GOVERNMENTAL ACTION.

Canada has many fine water powers, some of the largest being comparatively close to the centers of population, yet the Canadians found that water power cost the ultimate consumer nearly as much as coal produced power. The basis of the charge was not cost of service but "what the traffic would bear." In spite of the natural wealth of the province in water powers, the rates for electric

service were the same as those in places not possessing such natural advantages, and they were in some cases even higher. This condition not only existed, but through the rapid absorption of the water power sites and the elimination of competition by consolidation and contractual relations between the different companies, it was rapidly becoming a condition that could not be ameliorated in the future without such an expense as would burden the enterprise with an interest charge that would leave any benefit to the people very much in doubt. Owing to the distance of Ontario from all the known Canadian coal fields it was clear that the prosperity of the province as a manufacturing center was inextricably bound up with the proper utilization and distribution of the "white coal" of the province. It needed but the recognition of these fundamental facts and their dissemination among the business men of the province to bring about an agitation culminating in the Ontario Hydro-Electric Power Commission and its work. A full history of the movement will be given in the complete report of the Conservation Commission. We desire to call attention in this place to a few deductions to be made from a general consideration of that history, as follows:

The movement was a popular movement, originating in common councils, boards of trade, and other civic bodies.

The movement was denounced as "socialistic," and all of the epithets and fallacious arguments that are now becoming familiar to us in connection with the Conservation Commission's policy were used in fighting the movement in Ontario.

The movement has been regarded not as a political but as a great economic question.

The government took action only upon a strong manifestation of the popular will.

The first definite recognition of the economic necessity for providence-wide distribution of power seems to have become public in 1903. In 1906 the present commission was created. In 1910 Hydro-Electric power was available from the transmission lines of the Province.

The popularity of the work and the confidence of the people in the Hydro-Electric Power Commission have been shown by ever increasing majorities in support of the policies of the Commission

whenever questions involving those policies have been submitted to the people.

As is always the case, time was required to arouse and educate the citizens. The economic merits of the project were so evident, however, that a simple understanding of it carried conviction of the necessity for applying it to Ontario.

In the words of the Hon. Adam Beck, Chairman of the Hydro-Electric Power Commission: "The primary object that the promoters of the Hydro-Electric scheme had in mind was the maintenance of the industrial supremacy of the province." The attention of the legislators of New York is invited to this statement, and they are requested to view the policy of the Commission from the standpoint of maintaining the pre-eminence of the Empire State.

WHAT THE CONSERVATION COMMISSION FOUND IN ONTARIO.

The investigation of the Commission disclosed that from the engineering standpoint the work of the Ontario Hydro-Electric Power Commission is highly successful. The construction is of a most substantial and permanent character, and gives more reliable service than that of the public service corporations with which it competes.

The system is now entirely self-supporting, as the rates charged for power are sufficient to provide an income which will pay the interest on the bonds issued to build the system, the operating and maintenance expense, the renewal or obsolescence charge sufficient to replace the entire plant in the event of new discoveries in the electrical art rendering the present plant obsolete, and further, for a sinking fund to begin in 1914 to retire the bond issue in 30 years. These rates have been reduced to the municipalities at various times as the sale of power increases.

In the city of Ottawa, where the municipal system has been in operation for seven years, the price for private lighting has been reduced to an average of 5.4 cents per kilowatt hour, and the price for mercantile continuous power ranges from $9.90 to $22.50 per horse power. As a result of this low rate, 98% of the houses of Ottawa are lighted by electricity and the plant earns a surplus annually.

On the same basis for lighting, and with approximately 50 per cent reduction on charges for power, the municipal distribution system of Toronto has earned a surplus in the quarter ending November 30, 1912.

The sales of current have so constantly and steadily increased that the prices to the municipalities have been continually reduced.

The municipalities and private consumers are getting light and power for half what they paid private corporations.

As has already been said, previous to the distribution of current by the Hydro-Electric Power Commission, the private companies had based their rates upon the principle of charging "what the traffic would bear." The basis of the rates made by the Hydro-Electric Power Commission is "cost of service," and the rates thus made were necessarily adopted by private companies. This fact has led to a minute and thorough study by all the companies, of all the elements of cost entering into the production, distribution and sale of electric current. Such analysis is bound to result in very substantial changes and economies in the cost of operation, and also in the elimination of discriminatory sales.

A second elemental cause contributing to this result is the very great increase in the market for electric current. It has been found that the entrance of governmental competition caused no loss to those companies which were under proper management. On the contrary, their growth continued at the normal rate, or better.

The third contributing cause has been the injection of competition, which has proved to be a spur to the private company. It has too often been found that the size of the dividend has primarily determined the rate which the consuming public has been willing to tolerate. So long as the desired dividend can be earned the rate is not diminished, and economies of operation and management are a matter of little concern to the private company. Competition has created a new condition, with the result that it has been found entirely feasible to earn the customary dividend at a lower price per unit of energy.

The economic welfare of a people depends upon the intelligence with which it utilizes its natural and human resources. Labor, and natural resources in use, are the elemental constituents of production of all kinds. It is one of the most beneficent functions of

government to provide, on equal terms to all, opportunities for the development and utilization of the resources of the country. "Scientific management" is now the fashion in manufacturing establishments. Why not apply some of its principles to the large affairs of the State and Nation? Scientific management involves study and analysis of costs and conditions followed by the elimination of waste of materials and labor. Scientific study and analysis have shown that the State of New York has undeveloped water powers amounting to over 1,500,000 H. P. that are now wasting their energy. The Hydro-Electric distribution system of the Province of Ontario demonstrates the feasibility of statewide distribution of power, through the agency of government and the gratifying results achieved thereby.

Canal Powers.

Under the Conservation Law, section 400, the Commission is charged with the appraisal and lease of surplus canal waters whenever the Superintendent of Public Works shall certify to the Commission that such surplus waters are available. Section 21 of the Conservation Law also requires, among other things, that the Commission shall investigate the use of the waters of the State for power. Obeying these mandates, the production of power from canal waters is being investigated by the Commission.

The Barge Canal Act expressly limited the design so that the canal was solely and primarily an instrument of transportation. It was foreseen that opportunities for power development would present themselves, but under the terms of the act these could not be made available. The surplus waters of the canal can be made valuable water-powers. On the customary basis of capitalization their value will be almost one-tenth of the cost of the canal itself. Important and intrinsically valuable as they are it must be kept in mind that their development and operation is a secondary matter, entirely subordinate to the use of the canal as a medium of commerce. The experiences of the past have justified the requirement that the generation of power must not handicap nor hamper the handling of the traffic, which the canal was created to carry.

The Commission has endeavored to estimate, as accurately as

may be done in advance of the completion of the canal, the quantities of power which can be derived from the surplus water under the ordinary traffic conditions, to ascertain how much of this power will be the property of the State and how it can be most advantageously developed. This work, which is still in progress, includes the project for the Capital District, to which reference has heretofore been made.

There are various localities in which there is a question as to the legal ownership and use of the water-powers created by the construction not only of the Barge canal but also of the original Erie canal. The Commission recommends that it be empowered by law to bring proceedings which will secure the State's title to all such properties, including or affecting water-powers, so that the way may be paved for the utilization of these powers as soon as the construction makes them physically available.

ANSWERS TO OBJECTIONS TO COMMISSION'S PLANS.

In the main, the Commission's plan has received the approval of the press, and the people of the State.

It is charged, however, that the plan is socialistic in that it authorizes the State to embark in business in competition with private capital. This criticism shows a failure to draw a true distinction between a public and a private purpose.

In these days nearly every municipality is required to furnish lights for its public streets and buildings, and for domestic and commercial purposes. It is a public function, as well as a public duty. In fact, the underlying principle governing this class of service is based upon the common public necessity and welfare. The courts have drawn this distinction, and held that a State or municipality may lawfully engage in any enterprise which is based upon the common good of the people.

The federal government has applied this policy in connection with the construction of reservoirs for the irrigation of waste and arid lands; also by withholding from private entry, large areas for the purpose of controlling the water powers, with a view of the ultimate development thereof for the benefit of the consumers. Likewise, forest lands have been withheld from private occupation in order to protect the water sheds of navigable streams. Coal

and oil fields have likewise been withdrawn from private grant in order to control and regulate the price thereof.

The State of New York has in many instances engaged in activities in competition with private capital. The establishment of schools for higher education, the construction of highways at public expense, the construction of the Erie canal, and its continued enlargement, the acquisition of salt mines, the purchase and operation of the Saratoga Springs, are all instances where the activities of the State have been employed in competition with private business.

Likewise the city of New York has entered into business in competition with private interests, by the construction of subways for the transportation of its people, and also by its purchase and operation of ferries, and ownership of the dockage facilities of Manhattan Island.

The city of Chicago, in connection with its drainage system, is actually engaged in the business of developing electrical energy and distributing the same to municipalities at cost.

More than 75% of our cities, and over 90% of our urban population are provided with water by municipalities. There is no distinction between the distribution and sale of water, and the distribution and sale of electric light and energy for municipal and domestic purposes.

If the conservation plan is socialistic, then all the foregoing national, State and municipal activities must likewise be socialistic.

It is also charged that the plan of the Conservation Commission is economically unsound, for the reason that the government can do nothing as cheaply and efficiently as can private enterprise. This has not been the experience in this State with respect to the distribution and sale of water by municipalities. Very little, if any, complaint has been made, where such plants exist. Rates are reasonable, and the service satisfactory, as a rule. Official misconduct, extravagance, fraud or scandal rarely obtain in these places. Much graver, and more frequent complaint exists against private corporations that furnish light and power to the inhabitants of our cities.

It is also urged that this class of service should be left to

private enterprise, otherwise private capital would suffer through competition. This argument concedes that the State can supply power more cheaply and more efficiently than private capital. Similar arguments have been made in all cases whenever municipalities have found it necessary to engage in public service, and thereby replace inefficient private management with public devices better adapted to the needs of mankind.

It is said that the evils arising from private management may be remedied by State regulation and control. We maintain that the distribution of electric energy by municipalities would be the most effectual method of regulating the cost and service by private companies.

It does not follow that private corporations would be driven out of business. By the exercise of efficiency, by the adoption of modern methods, and by the reduction of prices to the cost of service, private companies could compete with municipalities in furnishing light and power.

DIVISION OF LANDS AND FORESTS.

The Conservation Law in relation to lands and forests (chapter 444, Laws of 1912) in its main outlines closely follows the bill which was prepared by this Commission and submitted to the Legislature for enactment, pursuant to the provisions of law. In regard to the so-called "top-lopping law," the Commission in its draft narrowed the scope of the original law so that the limbs and branches of evergreen trees should be lopped in the so-called fire-towns only; and this limitation is found in the present law. The Legislature, however, struck out the clause providing a specific penalty for failure or refusal to lop the tops. This is an anomalous condition. While there may be statutory authority for the imposition of punishment for refusal or failure to comply with the top-lopping law, nevertheless the fact that the Legislature has seen fit to eliminate the specific penalty tends to create a doubt in the public mind as to the wisdom and necessity of such a law; and in order that laws shall be respected as well as enforced it is necessary that there be no doubt in the public mind of their wisdom, or at any rate of the belief of those who enacted them that they are wise.

The Commission, therefore, on its own motion instituted an investigation and held a series of hearings to which it invited especially those persons who would be likely to be interested in the operations of the top-lopping law or who might possess special information relative thereto, as well as the general public. Care was taken, through correspondence as well as through the public press, to give as wide publicity as possible to the fact that these hearings were to be held, and to have the purpose thereof thoroughly understood. The importance of these hearings seems to require the transmission of a special report to the Legislature outlining the facts brought out and the conclusions reached. In general, however, we maintain that the top-lopping policy has been vindicated in practice and has served as an efficient means of checking the spread of forest fires. We therefore recommend the re-enactment of the clause prescribing a specific penalty for violation of the top-lopping law.

FOREST TAXATION.

In chapter 444 and in two special acts amending the Tax Law the last Legislature initiated a new policy relative to the taxation of forest lands. The underlying principle of these laws is that the owner of woodlots ought to be upon a parity with the owner of agricultural lands; that is to say, he ought not to be subjected to an annual tax when it is impossible for him to reap an annual crop. Necessarily, a long term of years must elapse during the process of reforestation, before the owner can realize any profit whatever from his investment.

BOUNDARY LINES AND VALUATION SURVEY.

One of the chief problems of forest administration has to do with the uncertainty of boundary lines. This fact is strikingly shown by a consideration of the statistics relative to trespass, which show that only three of the twenty-seven cases reported as committed during 1912 amounted to over $25 in computed value of material, and that many if not most of the trespasses at the present time appear to be due to the uncertainty of boundaries or disputes as to title.

In 1909 there were 83 trespass cases reported; computed value

of material, $39,063.07; average damage per case, $470.64. In 1910 the number of trespass cases reported was 104; computed value of material, $20,054.29; average damage per case, $192.82. In 1911 there were 46 trespass cases reported; computed value of material, $1,499.20; average damage per case, $32.59. In 1912, in the 27 cases reported the computed value of material was $502.23, and the average damage per case, $18.60.

We recommend sufficient appropriations to enable the commission to make a careful survey in order that boundary lines may be definitely established for all time, and also a valuation survey, by means of which the value of the State's holdings may be accurately determined.

While the decrease noted in the number and extent of trespasses is gratifying, if the boundary lines are thoroughly established an even better showing can be made.

FOREST CAMPERS.

At the present time campers may occupy temporary forest camps on State land, but there is no provision possible for the leasing thereof. It is estimated that there are 400 miles of suitable camp sites on the shores of lakes and ponds owned by the State in the Adirondack section alone. If it were possible for the State to lease these camp sites, under suitable regulations and restrictions, it is believed that the lessees, who would have a direct interest in the preservation of the property, would efficiently aid in the work of protecting the forests from destruction by fire; whereas, under the present system there is no accurate means of learning the names and addresses of temporary campers, from whose carelessness many serious forest fires have originated. We therefore recommend that the Constitution be amended so as to permit the leasing of camp sites in the forest preserve.

UTILIZATION OF RIPE TIMBER ON STATE LAND.

A more serious and important matter, in which the fundamental law ought to be changed, relates to the utilization of ripe or mature timber within the forest preserve. It is now known that the removal of ripe timber is necessary to intelligent reforestation and growth; and that the leaving of trees to decay not only destroys

the beauty of the forest and hampers its growth, but is an actual menace to its safety. It is known that the available ripe timber on State lands has a very great monetary value.

That the intent of the framers of the Constitution, when they prohibited the removal, sale or destruction of timber within the forest preserve, can have been to prevent the removal of dead and down timber, is hard to believe; but at any rate in the nearly twenty years since the Constitution was adopted many important economic, industrial and administrative changes have occurred and especially there has been a marked advance in the general appreciation of the importance of scientific forestry. In all logic, the fundamental law should be amended so as to permit the removal of dead timber.

THE MORTGAGE LANDS.

There are in the Forest Preserve counties of the State more than 8,000 acres of land to which the State acquired title through the foreclosure of mortgages given to the United States Loan Commissioners. Unless this was wild land when the mortgage was foreclosed it did not become part of the Forest Preserve, and therefore does not come under the jurisdiction of the Conservation Commission. We respectfully submit that all such mortgage lands, lands acquired by the State in the construction of canals and not necessary to the maintenance and operation thereof, and land which is a part of any abandoned canal system — in short, any State lands not essential to the functions of any other State department — ought to be put under the jurisdiction and control of this Commission. The result would be that all such land which is adapted thereto might be reforested, and other land could be judiciously leased, so as to produce a revenue for the State.

FIGHTING FOREST FIRES.

The organization of the fire fighting force of the Conservation Department has not been materially altered as the result of the enactment of chapter 444. There are still five districts, of which the Adirondack section has four and the Catskill section one, each of which is under the immediate supervision of an official who

was formerly known as a superintendent of fires, but is now known as a District Forest Ranger. The fire-fighting force under these officials, formerly known as fire patrolmen, are now known as Forest Rangers. It is believed that the new titles better express the duties actually performed by these officials. There is also an auxiliary force, serving only in emergencies, under the old law bearing the title of Special Fire Patrolmen, but now called Fire Wardens. Under the new law the force of railroad fire inspectors was increased by the addition of two, and the State was divided into two districts, with a Chief Inspector for each district.

The present year was marked by much more rainfall than the year previous; but in certain parts of the State during the months of June and July there was a long period of dry weather. The showing in fire protection for the year has been excellent. There were 383 forest fires reported, which was one-third fewer than the number which occurred in 1911; and of this total only a small proportion could be called large fires. Only 15 burned over 100 acres before they were checked. The total area burned during the current year is but one-fifth of that burned in 1911, and the expense of fighting fires has been reduced by more than three-fifths; the total damage done by forest fire decreased approximately three-fourths, or from $43,000 to about $11,000. Of the acreage damaged by fire only 185 acres were virgin timberland; and of the total acreage under protection by the State less than 7,000 acres, or one-tenth of one per cent. suffered from fire.

RAILROAD FIRES.

More than any other one agency, railroad locomotives have been responsible for forest conflagration, but it may be noted that no railroad fire this year burned over an area exceeding 40 acres, and most of the land which was damaged in this way was denuded or brush land on the outskirts of the forest proper, so that the actual amount of damage from this source was comparatively small. Insistence upon better cleaning of rights-of-way, the use of improved protective devices on locomotives, and increased vigilance on the part of the fire-fighting force are responsible for the decreased severity of railroad fires.

Mountain Observation Stations.

The mountain observation stations have again demonstrated their utility in the early detection of forest fires, and the prompt extinguishment thereof. The statistics of this department show that the number of fires reported from mountain stations exceeds the actual number of fires; but this is a demonstration not of inaccuracy but of efficiency, for it arises from the fact that in a number of cases a fire has been observed and reported from more than one mountain station. This Commission has pursued the policy of adding to the number and equipment of mountain stations as appropriations have permitted. The number of new stations installed during this year was 13, as follows: Adams, Belfry and Poke-O-Moonshine, in the county of Essex; Debar and Loon Lake, in the county of Franklin; High Point, Mohonk and Slide, in Ulster; Moose River, in Lewis; Rondaxe and Stillwater, in Herkimer; Swede, in Warren, and Tomany, in Hamilton. The total number of mountain observation stations has thereby been increased from 36 to 49, and in each case it has been necessary for the commission to construct suitable telephone connection, using its own force therefor.

Reforestation.

In the work of reforestation there has been a steady extension, and in the sale of trees by the State to private owners there has been a corresponding increase. At the same time private owners have had large acreages examined by this department with a view to scientific forestry and the various State Institutions are actively engaged in the practice of forestry on their various lands. During the past year two new State nurseries have been established, one of five acres on the lands of the Great Meadows prison at Comstock, where the work has been done by the prisoners, and one of five and one-fourth acres near Lake Clear Junction. The State now has eight nurseries comprising about 49 acres of land and containing approximately 19,000,000 trees of various ages. During the year nearly 1,345,000 trees have been planted on State land in the forest preserve and 560,000 at State institutions. Effort has been made to locate forest plantations along the customary lines

of travel so that they may be accessible for inspection, thereby bringing the work to the attention of the public. Out of 3,334 acres of forest preserve land which has been reforested with stock from the State nurseries, 1,353 acres were set out during the present year. The new law permits this commission to supply trees to State institutions for their use free of charge, and this provision has tended to an increased demand. The State will have available for sale in 1913, 3,692,000 transplants and 1,000,000 seedlings. For the year 1912 the State had eight nurseries, with an area of 49 acres; capacity 19,468,000 trees; trees sold to private owners, 3,587,875; trees planted on State land, 1,346,500.

Under the requirements of the Conservation Law this commission has examined nearly all of the forest properties of the various State institutions and transmitted reports to the various officers in charge, making recommendations and giving advice relative to the protection and improvement of forest and shade trees on such properties. The 40 State institutions coming under such inspection have a total land area of about 35,000 acres, and the varying character of growth, use and needs of the institutions have presented numerous problems. In general the work on the woodlands connected with the State institutions comes under three heads: First, cutting for the purpose of improvement and to provide the necessary wood crop; Second, reforestation; Third, protection against fire, disease or insects.

TREE DISEASES.

The prevalence of the chestnut bark disease and similar infections of the trees led to the creation of the position of pathologist in the Forestry Bureau of this commission and the work thereunder has been conducted in co-operation with the State Department of Agriculture. Many letters have been received making inquiry concerning tree diseases and special trips have been made to various parts of the State for the purpose of getting first hand information and co-operation with various owners. The fact that the State suffers losses each year amounting to millions of dollars through the ravages of forest insects amply justifies serious consideration by the Legislature.

PURCHASE OF FOREST LANDS.

No appropriation was made last year for the purchase of lands in the Forest Preserve. An unexpended balance amounting to the sum of $69,694.34 was reappropriated, and made available for the purchase of land in the Adirondack and Catskill Parks. Owing to the fact that so small an amount was available, no effort has been made to enter into new contracts for the purchase of lands in these parks. The money so reappropriated has been held to pay for lands which were heretofore offered to and accepted by our predecessors, subject to the production of a marketable title by the owners. A very small part of the money so reappropriated has been expended for this purpose, because it has been found that the owners have not been able to furnish acceptable title.

Of the sum so reappropriated by the last Legislature there remains unexpended $62,809.78, which we deem sufficient to pay for all lands accepted by the State, for which satisfactory titles can be furnished.

It often happens that tracts of land within the Adirondack and Catskill Parks are offered at prices which are deemed reasonable by this Commission, and in order that there may be available moneys to take advantage of such offers, we recommend that an appropriation of not less than $25,000.00 be made for this purpose.

The State now owns 1,651,553 acres of land in the Forest Preserve counties, of which 1,412,636 acres are situated in the Adirondack Park and 102,245 acres in the Catskill Park. The remaining lands, aggregating 136,672 acres, are situated in the Forest Preserve counties outside the Parks proper. These lands consist of detached parcels, widely scattered, and it has been found impracticable to protect the same properly from destruction by fire and damage by trespass. These detached tracts are largely of small acreage and of little benefit to the State.

We recommend that measures be taken to enable this Commission to sell these lands and use the proceeds thereof for the purchase of other lands within the parks proper.

DIVISION OF FISH AND GAME.

Chapter 318 of the Laws of 1912, which went into effect April 15, 1912, revised and consolidated into the Conservation Law all the laws relating to fish and game. In the preparation of this chapter, the Commission consulted with organized sportsmen throughout the State, and after it was introduced into the Legislature there were several largely attended hearings held by the Legislative Committees. In its progress through the Legislature the original bill underwent many changes, some of them of considerable importance.

The net result is a codification in which the underlying principle is that of uniformity, the endeavor having been to do away, to the utmost extent possible, with confusing and at times utterly inconsistent local provisions relative to the taking and possession of fish and game. In actual operation the new law has in the main vindicated the expectation of its framers, and it has marked a decided improvement over conditions existing prior to its enactment. It is not to be expected, however, that the first draft of a uniform law covering so large a field should be perfect; and this Commission expects to submit to the present Legislature a number of amendments intended to simplify the language and to clarify certain portions of the law, preserving, however, the underlying principle of uniformity.

ADDITIONAL PROTECTION.

It was recognized, in the framing of this portion of the Conservation Law, that there are, in so large a State as New York, involving so many different climatic conditions, certain local exigencies which require special treatment as to the close season. The law, therefore, vests the Conservation Commission with power, upon due petition, and after a hearing and proper publication, to give additional protection to fish and game by an extension of the close season as to any particular species.

Under this provision of the statute, the Commission, on May 8, 1912, issued an order prohibiting the taking of black bass in the waters of Lake George except from the first day of August to the

thirtieth day of November, inclusive. This order was made effective on the 15th day of June, 1912, and ceased to be operative on the 31st day of December. But the Lake George petition, in so far as it asked additional protection for the species of fish commonly called lake trout and pickerel, was denied, for the reason that the desired relief could not be granted so as to become effective during the year 1912.

Other petitions for additional protection to fish and game, acted upon by the Conservation Commission under the provisions of section 152 of the Conservation Law, are as follows:

COUNTY	Name of petitioner	Species	Disposition
Fulton	Hubert J. Clifford	Varying hares	Granted Jan. 15–31 inc
Herkimer	Robt. F. Livingston	Pheasants	Granted Oct. 1, 1912–Oct. 1, 1914
Otsego	M. H. Nichols	do	do.
Delaware	G. C. Pomeroy	do	do.
Chenango	Fred L. Ames et al	do	do.
Oneida	W. S. French	do	do
Montgomery	John J. Best	do	do
Lewis	C. Fred Boshart	do	do
Madison	Louis Fuess	do	do.
Washington	Charles B. Dix	do	do.
Warren	Charles B. Dix	do	do.
Schenectady	A. T. Sitterly	do	do.
St. Lawrence	Charles H. Simonds	do	do.
Franklin	Walter C. Rice	do	do.
Fulton	S. E. Trumbull	do	do.
Jefferson	Geo. A. Lawyer	do	do.
Clinton	F. J. Riley	do	do.
Essex	W. H. Roberts	do	do.
Genesee	C. W. Gardiner	Ruffed grouse	do.
Richmond	Ed. S. Rawson	Cotton tail rabbits.	Granted Oct. 1 to Nov. 14 inc. each year.
Saratoga	John M. Corey	Pheasants	Denied.
Oswego	Mannister C. Worts	do	do.

PROSECUTIONS FOR VIOLATIONS.

Statistics on file with this department show that the game protectors have prosecuted during the present fiscal year 1,695 cases, as against 1,485 in 1911, or 210 more cases than during the preceding year. Of this total, 1,607 were successful. The time will undoubtedly come when popular sentiment is so well educated that the average citizen will be himself at all times a game protector. But until that time comes, the test of efficiency must largely rest upon the number of cases of violation of the law successfully prosecuted; and upon this test the work of the past fiscal year is satisfactory.

THE NEED OF ADDITIONAL PROTECTORS.

The Legislature of 1912 granted to this department 30 additional game protectors, making the total number 125. Effort has been made to assign the additional protectors to those counties and localities where the need of more protection appeared to be most acute. But our correspondence is replete with urgent requests for more protectors in nearly every part of the State; and there can be no doubt that additional protectors are urgently required.

If the law were amended so as to permit the appointment of sufficient regular protectors, it would then be safe to dispense with the position of special protector. These special protectors, appointed usually at the request of an organized association for the protection of fish and game, or of a board of supervisors, receive no fixed compensation. While in some cases special protectors have rendered valuable service, and have afterwards become among the best of the regular protectors, many of them have rendered but little service and some of them have proved an actual detriment to the work of the regular protective force. We believe that the moiety system, under which the special protectors are paid, is subject to great abuse and may easily lead to the starting of merely technical cases, which annoy individuals without contributing in any way to the real work of efficient protection, and may tend to bring the whole law and its enforcement into disrepute. We strongly recommend that this department be permitted to employ sufficient regular protectors so that the position of special protector may safely be abolished.

ADDITIONAL GAME FARMS NEEDED.

The State's one game farm has proved a great success, but is wholly inadequate to meet the demand for pheasants and pheasants' eggs. There is need for additional game farms. During the past year, there were 4,236 applications for birds and eggs. Out of 126,361 eggs applied for, the department was able to supply but 12,681; out of the 28,261 birds applied for, but 3,409 could be supplied. The Legislature last year passed a bill providing for four additional game farms, which on account of the condition

of the State's finances, the Governor felt constrained to disapprove. We strongly recommend that provision be made at the present session of the Legislature for additional game farms.

REVENUES OF DEPARTMENT.

Reference to the financial statement of this department, which is appended to this report, will show that the revenues turned over to the State treasury by the Conservation Commission amount at the present time to about a quarter of a million dollars annually. For the fiscal year ending September 30th last the total receipts were $256,002.84. Of this sum over $152,000 was derived from hunters' licenses. The tagging of foreign game, which is a new source of revenue, yielded over $20,000; the netting license fees amounted to about $9,000. These revenues come from sportsmen and others who are quite content to contribute something to the support of the State government, but feel that they have a right to expect better protection and propagation of fish and game as a result of their contribution. The Legislature may well bear this point in mind, as well as the fact that moneys devoted to the propagation and protection of our wild life are well invested.

DEER IN ADIRONDACK REGION.

Reports from the regular game protectors show that the supply of deer in the Adirondacks is greater than at any time during the past quarter of a century. This increase is attributed in part to better enforcement of the law, and in part to the successful experiment of cutting and stacking the marsh hay on which the deer could subsist during the more severe weather.

THE BUCK LAW.

Perhaps no feature of the Conservation Law in relation to fish and game has attracted more discussion than the so-called "buck law," which restricts the taking of deer to bucks with horns not less than three inches long. While this provision is new to the statutes of the State of New York it has been successfully tried in other states; and while it has not been in operation in this State a sufficient time for a conclusive test to be made,

the department is satisfied that it is working well and producing good results.

There have been published in various parts of the State stories of large numbers of does killed and left to rot in the forest as a result of this law, which was intended of course to prohibit the killing of does. Every possible effort has been made to run down these stories and the conclusion arrived at is that to say the least the reports have been grossly exaggerated. But over and beyond the intent of the "buck law" to protect the female of the species, was the desire in the minds of its framers to protect human life. It was intended to make the hunter more careful. We believe there is every justification for retaining the "buck law" and giving it a thorough test for at least another full season.

ADMINISTRATIVE CHANGES.

The chief administrative changes, under the new law, relative to the protection of fish and game, have been the creation of the offices of Deputy Chief Game Protector and Superintendent of Inland Fisheries, the increase of the number of protective divisions from ten to twelve, and the appointment of additional Division Chief Game Protectors accordingly. The several divisions are known as the Northern Adirondack, Southern Adirondack, Eastern Adirondack, Eastern, Western, Southern and Central New York, Hudson, St. Lawrence, Allegany, Ontario, Metropolitan and Long Island divisions.

PROPAGATION OF FISH.

The number of fish distributed from the nine hatchery stations of the State for the past fiscal year was 730,434,933. This is an increase over 1911 of 28,986,539. Fish planted in 1912 had a money value estimated at $210,934.79, while the outlay for maintenance, including repairs and improvements, amounted to but $61,505.40. This estimate of monetary value is based as far as possible upon the prices of fry and fingerlings at the commercial hatcheries and upon the market value of the different species at first hand. It is considered conservative and must be regarded as a gratifying return upon the investment.

The number of species propagated and distributed by the Commission in 1912 was thirty-nine.

The Legislature of 1912 authorized the construction of two additional fish hatcheries, one to be located in St. Lawrence county and the other in Warrensburgh. For each of these hatcheries an appropriation of $20,000 was made. A contract has been entered into for the construction of the new St. Lawrence county hatchery, which is to be devoted primarily to the propagation of bass. Up to the present time no suitable location has been found for the other proposed hatchery. When these new hatcheries have been completed, and necessary betterments have been made to the hatcheries now in operation, the State will have a plant for the propagation of fish adequate to all present needs.

This State ranks first in fish culture; but a great and growing problem has to do with the pollution of streams, which unless it can be speedily checked is a serious menace to future work in this direction. Inasmuch as the waters of the marine district, being closely contiguous to the greatest city in the new world, are peculiarly subject to pollution, our principal discussion of this question will be found under the head of Bureau of Marine Fisheries. Practically all that is there said, however, applies more or less to other parts of the State, for there are few streams or waters which are entirely free from the danger of pollution.

BUREAU OF MARINE FISHERIES.

The revenue derived from the Bureau of Marine Fisheries during the fiscal year ending September 30, 1912, was $25,154.76, being the largest in its history. There has, however, been a decrease as compared with the previous year both in the number of applications for leases of shellfish lands and in the acreage actually disposed of. This cannot be ascribed to any one cause, but is probably the result of a combination of influences, among which is doubtless the unsatisfactory condition of oyster-growing in certain localities due to the so-called "polluted oyster" scare. The natural diminution of the amount of land available for shellfish culture has also been a factor in this result.

It has previously been noted that prior to 1907 lands devoted to the cultivation of shellfish had not been the subject of any

marked degree of State regulation. On the contrary, with seemingly no appreciation of the value or possibilities of this natural resource, the State had for years granted gratuitously to individuals perpetual franchises for shellfish cultivation, and by various enactments had ceded to certain of the Long Island counties thousands of acres of valuable oyster-growing properties. The resulting situation is therefore unique. Although the total acreage under cultivation is approximately 110,000, the State has jurisdiction of less than 35,000, one-half of which is held on lease, paying an annual rental, and the balance under franchise to individuals, contributing merely an annual tax of twenty-five cents per acre.

Divided Jurisdiction.

This condition of divided jurisdiction makes effective and consistent State supervision most difficult of attainment. This was well illustrated in the fruitless endeavor during the year to secure the passage of a suitable statute for the sanitary inspection and certification of shellfish grounds and their product, a law of the highest importance to public health. The present law relative to sanitary inspection is by express restriction so limited in its application that fully two-thirds of our shellfish lands are exempt from its provisions. While the statute imposes upon this bureau the duty of making these sanitary examinations and issuing the necessary certificate, no provision was made by tax or appropriation to render compliance possible. The bill recommended by the Commission provided for a sanitary inspection tax of twenty-five cents per acre for each acre certified. It was estimated that this sum would meet the actual cost of making the examination. This provision does not appear in the law as finally passed. Whether the oyster grower should bear the cost of the inspection, or provision be made for it by appropriation, may properly be within the domain of argument, but there can be no debate on the absolute right of the public to protection against the dangers of sewage-polluted and disease-producing oysters. A majority of intelligent oyster growers recognize the necessity of cultivating and marketing their products under healthy conditions. There are, however, a few to whom profits are vastly more important than any considerations of public health.

Sewage Contamination.

That oysters polluted by sewage contamination are a menace to health is no longer an open question. Many acres of shellfish lands lie in waters that are receiving the untreated sewage of some of the most populated districts of the State. A sanitary survey of Jamaica bay made under the direction of this department during the year shows that upwards of 40,000,000 gallons of raw sewage are daily discharged into its waters — subject to the action of wind and tide. These waters cover 2,600 acres of oyster bottoms, as well as an extensive area of natural clamming lands. The growth of population in the metropolitan district, particularly on Long Island, has made the question of sewage contamination one of ever-increasing seriousness. While polluted areas may be utilized within a proper limit in oyster culture, no shellfish showing contamination to a degree dangerous to health should be marketed from such districts. The report of the Metropolitan Sewer Commission for the year 1912, recently published, contains an exhaustive study of the subject of the contamination of the waters adjacent to New York, and embodies the findings of a committee of experts acting for the municipal authorities. Their work will undoubtedly find practical expression in a system of sewage treatment and disposal that will be most effective in the elimination of the nuisance. The example of the city of Baltimore in protecting its harbor and the valuable oyster bottoms adjacent thereto by means of a system of sewage-disposal plants is a splendid illustration of the results possible of accomplishment by modern methods. Undoubtedly, many sensational reports have been current concerning the oyster as a typhoid carrier, the majority of which were without foundation in fact. Nevertheless, enough has been demonstrated to make impossible of denial the assertion that the disease has been positively traced to this bivalve. The problem of sewage disposal is primarily a matter of local regulation.

Sanitary Examination.

Pollution cannot be eliminated at best until after the lapse of a considerable period, but in the meantime it is imperative that the Conservation Law be amended to provide for the sanitary

examination of every acre of shellfish lands within the State. The State's certificate of sanitary condition would quickly be recognized by oystermen as a valuable business asset, tending to inspire public confidence in the healthfulness and safety of this most delicious food, at present so commonly looked upon with suspicion, and by many refused altogether unless cooked. The cost of making the examination should be borne by the growers. The examination should be made in part by a bacteriologist, following the standard of purity for shellfish adopted by the United States Pure Food Inspection Bureau. This is absolutely essential if our growers are to protect themselves in the shipment of their products in interstate commerce. The conditions found in Jamaica bay do not by any means condemn all the oyster lands covered by its waters, but they do determine that within certain areas the degree of sewage-pollution is sufficiently great to render oysters grown in such districts unfit for food if marketed directly from these waters.

By chapter 522 of the Laws of 1912, supplementing chapter 568 of the Laws of 1909, the State granted to the city of New York all lands under water in Jamaica bay, for harbor purposes. This will result in the destruction of many acres of shellfish lands. Nevertheless, the necessity of efficient supervision is not in the least diminished.

The discharge of untreated sewage and the waste product of manufacturing establishments into the Hudson river has resulted in the destruction of many acres of oyster lands, and has wrought great damage to shad and other fisheries in those waters. The growing appreciation of the necessity for sewage-disposal plants and the agitation for them in our cities is at least a hopeful sign; their installation means the abatement of a nuisance and menace of huge proportions.

Every country of Europe prohibits its manufacturers from discharging those waste products into public streams. Our law contains such a prohibition when the waste is destructive of fish life or oyster culture. There is no practical method for its enforcement. The Commission should be given power to determine whether or not the degree of pollution is sufficient to endanger fish life and the right to an injunction if necessary to give effect to the statute.

Shellfish Leases.

Section 304 of the Conservation Law requires that all leases of lands under water for shellfish culture must be sold at public auction, and that no lands shall be leased for less than twenty-five cents per acre per annum. If the sole purpose of auctioning leases was to promote competition, this provision of the law is a failure. There never has been any competitive bidding. This bureau, however, refuses to accept bids of less than two dollars per acre per annum.

The lands are now and have been for the past five years invariably struck down on a single bid at the uniform price of two dollars per acre per annum, regardless of locality or any other condition, save only that oyster beds of natural growth are not leasable. This uniform rental seems to have been the result of custom rather than inspired by any endeavors to ascertain true rental value. That it has at times been in excess of the actual value is evidenced by the occasional surrender by the lessee of parcels, the productiveness of which evidently is not sufficient to warrant the further efforts of the holders to cultivate them. During the year the bureau has been confronted with a new situation which may require a departure from the custom of leasing at a uniform price. The amount of land in our bays and protected waters still available for lease is not large. There is believed to be no considerable area of good shellfish land still unleased outside of Staten Island sound, Raritan bay, and one or two other protected bodies of water. There is, however, a very considerable acreage in Long Island sound that might be available, but which it is contended by planters could not be profitably leased at two dollars per acre. It is the desire of some of the planters to take up these lands "for experimental purposes" at greatly reduced rent for the first five years of the lease, with the privilege of cancellation at any time. It is claimed that these lands being in open waters, usually considerable distance from harbors, exposed to storms, shifting sands, and the ravages of the oyster's natural enemies, the star-fish and borer, cannot be profitably leased at the present uniform price. A radical decrease in rent must be supported by a substantial reason. The statute makes it incumbent on the Commission to classify the leaseable lands according to their value. This subject has, during

the year, received a great deal of attention for the purpose of establishing a rational basis of valuation in lieu of the present unscientific and haphazard method. A study of the methods in vogue in other States is on the whole unprofitable. The natural conditions are dissimilar. Location, character of bottom, food contents of water, salinity, temperature and currents are all important elements in arriving at an accurate conclusion. The practical difficulty is that the determination of most of these elements is not within the power of the bureau as at present equipped. The experience of practical oystermen is doubtedless of value, but it should be supplemented by science. Reasons multiply why this bureau should have, conveniently located on Long Island, a biological laboratory where problems of this character could be studied. At such a marine station our bacteriological examinations of shellfish could be made; studies in the habits, spawning grounds and propagation of marine food fish prosecuted. With the limited means at our disposal we succeeded in propagating at the Cold Spring Station nearly 400,000,000 marine species during the present year. Could we not reasonably expect to accomplish a vast deal more toward augmenting the supply of food fish with proper facilities?

New York is not keeping pace with some of the other states in these matters, although its oyster and marine fish resources have now great potential value and might be easily developed for the public good. There are many problems relative to oyster culture that could be solved at a marine biological station. A distinguished scientist in recommending the establishment of such a laboratory to the shellfish authorities of a sister state says: "Nowhere in the world is the star-fish so destructive to the oyster as in Long Island sound * * *. Any discoveries that could abate this nuisance would be worth more to the oyster growing interests of the State than the cost of a fully equipped biological station for a century. It is not expected that any such complete success will come from the establishment of such a station any more than the agricultural interests of the State expect that the San José scale or the potato beetle will be exterminated by the State Entomologist, but it is a well demonstrated fact that the money expended on insect investigation is returned tenfold to the

people of the State and that without such investigations successful agriculture would hardly be possible." Connecticut and New Jersey have for several years conducted marine laboratories for the investigation of these important questions.

Concerted Action Required.

The best results in the propagation of marine migratory food fish require concerted action on the part of the various Atlantic Coast and Gulf States and particularly uniform legislation covering those species which it is desirable to protect by the establishment of a minimum size limit. A convention of the marine fisheries authorities will be held during the present year and probably in conjunction with the federal fish Commission.

The need of proper laws regulating the use of nets in the marine district is great. While the inland fishermen in the Hudson and those north of the city of Newburgh are subject to an annual net license, those south of that point or operating in the waters adjacent to Long Island are subject to no license fee and practically exempt from all restriction. The unwisdom of such legislation needs no comment. In no other State in the Union are pound nets holding tons of marine fish permitted to operate without making some return to the State. A just and reasonable tax upon an apparatus of this character should not meet with serious opposition. The revenues thus acquired if used in the interest of augmenting by scientific methods our food fish supply would bestow substantial benefits on those engaged in fisheries as well as greatly increase and cheapen an important source of wholesome food.

DIVISION OF INLAND WATERS.

The Commission has made during the past year an extended study of the legal and engineering features of the development of power at Niagara Falls. The amount of water which may be diverted for power purposes from the Niagara River above the falls has been fixed by treaty with Great Britain at 36,000 cubic feet per second on the Canadian side, and 20,000 cubic feet per second on the American side. Under a Federal law, the water on the American side is used under permits issued by the Secretary

of War. Permits have been issued to two existing companies to use an aggregate of not exceeding 15,100 second feet. Five hundred second feet have also been allowed for use at Lockport from the Erie canal, leaving 4,400 second feet still unassigned.

The total fall from Lake Erie to Lake Ontario is 327 feet. The fall of the river from a point opposite the intake of Niagara Falls Power Company to the Devil's Hole is about 300 feet. A flow of 20,000 second feet used on this head would give about 540,000 net horse power. This is about the ultimate amount that can be economically developed on the American side under the present treaty. Owing to incomplete utilization of fall, the present companies can ultimately develop under the most favorable conditions of operation only about 210,000 H. P., with 15,100 second feet.

With reference to the 4,400 second feet, for which permits have not yet been issued by the Secretary of War, the Commission believes that every effort should be made to retain it for the use of the State.

OSWEGATCHIE RIVER POWER SURVEYS.

The Commission has continued the work of making surveys of the streams of the State with special reference to ascertaining the amount of developed and undeveloped powers. An engineering party has worked the entire season on the watershed of the Oswegatchie river. Field work is still in progress, and the results of the survey are not yet available. It is proposed to issue a pamphlet covering the entire subject of power development on the Oswegatchie river as soon as the work is completed and the results compiled.

Several promising sites for storage reservoirs have been surveyed and the magnificent power possibilities of the Oswegatchie investigated.

ORLEANS WATER SUPPLY PROJECT.

In the counties of Erie, Niagara, Orleans, Genesee and Monroe, comprising the northwestern section of New York State, natural conditions and their modifications, brought about by settlement and cultivation, have combined to make it very difficult and costly for the numerous small cities and villages to secure adequate supplies of pure and wholesome water for domestic purposes.

Supplies from wells are utilized by several of the municipalities, but the region is not an artesian basin and all well supplies are merely local surface waters more or less naturally filtered. Their quality is almost universally bad because of both pollution and hardness. In quantity they are entirely inadequate. Their cost is excessive.

The Niagara river and the Erie canal waters are the only easily available supplies adequate in quantity. The Niagara river supplies the larger cities of the region, and the canal is drawn upon more or less frequently in case of shortage by the other municipalities. The Niagara river waters when filtered under competent supervision can be made reasonably pure and wholesome, but their use in an untreated condition or after treatment under inexpert supervision is pregnant with public peril. Against the use of canal waters there is a public prejudice such that other water can be sold at almost any price in competition with water from the canal whether treated or not. This public prejudice arises from unhygienic conditions existing along the canal, and it is entitled to respect and sympathy.

In the face of the natural and artificial difficulties set forth above, the resources of any but the very largest municipality are puny and inadequate, and as a result the municipal water supplies of the region are either entirely inadequate or impure, or both.

These conditions challenged the attention of the Conservation Commission very soon after its appointment and organization, and active studies of the problems were immediately begun under the authority of the Conservation Law.

Typhoid in the Lake Ontario and Western Division of the State.

The section of the State covered by this project corresponds roughly with one of the divisions of the State made by the Board of Health and called by them the Lake Ontario and Western Division. This division has normally a lower death rate than the average for the entire state in the ratio of 11.7 to 16.8, and lower than five of the seven other divisions of the State. As to typhoid fever, however, the showing is the reverse. The district has the undesirable record of being the third in the list of districts arranged according to the average death rate from typhoid for the ten

year period 1901–1910, and in some of the individual years it jumps into the lead.

Typhoid is a water-borne disease, and the high ratio shown is unquestionably due to the inferior quality and contamination of the water supplies used in this district. Filtration carried out under competent supervision would, of course, partly remedy the situation, but the cost of pumping, filtering and repumping where necessary is heavy, and is especially relatively great when the quantity of water is small. The larger cities are able to carry out such enterprises without seriously feeling the burden, but the small municipality finds it very difficult and expensive to secure and pay for the kind of service required to obtain proper results. It is the essence of the scheme herein proposed to secure for all of the municipalities of the region the advantages which can be obtained from operation on a large scale. For each municipality to reach out and secure individually an adequate supply of water of the kind demanded is impracticable financially. By uniting them all in one system, a supply can be secured at a price little if any greater than the cost of individual pumping and filtering alone, even if water otherwise suitable were at hand.

The Proposed Supply from Linden.

To meet the requirements of the district and furnish an adequate supply of superior quality, the Commission proposes to impound the waters of Little Tonawanda Creek in a reservoir to be created by the construction of a dam across the creek at Linden. This proposed supply was selected for investigation after considerable study and reconnaisance. Surveys, underground investigations, stream flow estimates, and plans for filtration and distribution have been prosecuted, and have proceeded to a point where the project is well blocked out and reliable preliminary estimates of cost can be made.

Brief Description of Proposed Supply.

The drainage area tributary to the reservoir is 21.7 square miles. The rock is near the surface over the entire area, and the run-off should be a large percentage of the rainfall. In the region along the lower Hudson, where the rainfall is somewhat heavier than

in this region, the run-off from each square mile, if it is all conserved, will supply 10,000 people. The yield of this drainage basin will probably be sufficient to supply from 150,000 to 200,000 people if it is all conserved, as may be very readily done by the Linden reservoir.

The dam site is just above the bridge at Linden. It is particularly favorable. The foundations will be in solid rock. The length is short, and the sides of the canyon steep. The crest of the spillway will be at an elevation of 1,151 feet above sea level, and about 80 feet above the bed of the stream at the site. About 10,000,000,000 gallons of water will be impounded and 1,150 acres of land flooded.

From the reservoir, the water will be taken to a filter plant below, and be filtered, though the supply would be perfectly sanitary without the filtration. Filtration in this case is simply an insurance measure, so far as healthfulness is concerned. Filtration will, however, improve the appearance and taste of the water.

Quality of Proposed Service.

The proposed supply will be free from deleterious bacteria, clear and fairly soft. The head available is not only ample, but will have to be reduced before introduction into the systems of the municipalities to be served. The reduction in insurance rates in towns now served with supplies insufficient in quantity or pressure will aid materially to pay for the new service.

Capital and Operating Costs of Orleans Project.

The preliminary estimate for the entire cost of the project is $5,000,000 for the reservoir dam, spillway, regulating works, filters, clear water reservoir, land damages, highway relocation and entire piping system, figured to supply to the municipally owned standpipes a total of 19,000,000 gallons daily.

Based on state or county or water district bonds, this project could be financed on about a 4% basis. The cost of operation and repairs is estimated at $25,000 per year. The total yearly charges become:

Interest 4% on $5,000,000	$200,000 00
Sinking fund charge (50 yr. 4%)	32,750 00
Operating costs	25,000 00
Total	$257,750 00

Cost per million gallons:

$$\frac{\$257,750.00}{19 \times 365} \text{ is } \$37.17$$

Availability of Linden Supply.

In considering the availability of the Linden supply in comparison with other sources, the following points must be taken into account:

The cost to the municipalities of pumping alone ranges from $25 to $75 per million gallons when all expenses are properly included.

To filter the water under proper supervision will cost the municipality from $5 to $15 per million gallons.

For many of the municipalities, sufficient acceptable potable water cannot be obtained at any price less than several times the cost of this proposed supply, and for the smaller municipalities, the price for a suitable supply on the small scale is prohibitive.

Pumping charges are a continuous cost; but the cost of the Linden water will be almost nothing at the end of fifty years when the bonds have been paid.

The character of the proposed supply is superior to all the present supplies and incomparably better than the majority.

The saving in fire losses and insurance, and in doctors' bills, loss of time in sickness, and all the other expenses due to sickness resulting from water-borne diseases, must be credited to the Linden supply in making up the comparisons with other supplies, contaminated as we have shown them to be.

WATER SUPPLY APPLICATIONS.

The work of the Commission during the past year in the equitable apportionment of water supplies to the various municipali-

ties of the State, as required by law, is briefly indicated by the following table:

No.		Application filed.	Disposition.
40	New York City, Suffolk County Sources	July 29, 1908	Pending.
100	Village of Mexico	Aug. 12, 1911	Disapproved April 13, 1912
101	New York City, Borough of Richmond	Sept. 12, 1911	Approved June 3, 1912
102	New York City	Sept. 12, 1911	Discontinued
103	Manhasset-Lakeville Water District	Oct. 24, 1911	Approved December 20, 1911
104	Village of Argyle	Dec. 9, 1911	Approved February 28, 1912
105	Staatsburg Water Co.	Dec. 11, 1911	Approved January 25, 1912
106	Village of Albion	Jan. 31, 1912	Pending
107	East Williston Water District	Feb. 16, 1912	Approved April 30, 1912
108	Village of Middleport	Feb. 19, 1912	Approved April 15, 1912
109	Baldwin Water Co.	March 29, 1912	Approved May 6, 1912
110	New York City-Schoharie Watershed	April 2, 1912	Pending
111	Village of Grandview	April 3, 1912	Approved May 27, 1912
112	Village of Piermont	April 19, 1912	Approved May 27, 1912
113	Hartsdale Water District	April 15, 1912	Approved June 4, 1912
114	Village of Wolcott	April 22, 1912	Approved June 4, 1912
115	Spring Valley Water Works & Supply Co.	April 27, 1912	Approved May 27, 1912
116	Village of Mt. Morris	May 10, 1912	Pending
117	Village of Peekskill	May 14, 1912	Approved July 31, 1912
118	Village of Fayetteville	May 27, 1912	Approved July 31, 1912
119	Village of Port Leyden	June 7, 1912	Approved September 10, 1912
120	Rochester & Lake Ontario Water Co.	June 14, 1912	Approved July 31, 1912
121	Village of Briarcliff Manor	June 22, 1912	Incomplete.
122	Sodus Water District	July 9, 1912	Approved September 10, 1912
123	Village of LaSalle	July 9, 1912	Approved July 31, 1912
124	City of Cortland	June 22, 1912	Approved July 31, 1912
125	Village of Brockport	July 23, 1912	Pending
126	Locke Water District No. 1	July 27, 1912	Approved September 24, 1912
127	Madrid Water District	Aug. 31, 1912	Pending
128	Albion Water Works Co.	Sept. 11, 1912	Pending
129	North End Water District Town of Scarsdale	Sept. 16, 1912	Pending
130	New Castle Water Co.	Sept. 23, 1912	Incomplete

The Commission should be empowered by law to intervene in the not infrequent cases in which existing water supply systems, especially those of private companies, are found inadequate to meet the demands for water of the communities which they serve. Control of rates charged for water should be exercised by State authority, as complaints of excessive and inequitable charges have been numerous.

The State should exercise greater control over the purity of the drinking water supplied to its inhabitants. Power to compel the

authorities of an existing water supply system to abandon a contaminated source of supply, to eliminate sources of pollution, or to install and maintain proper filtration or other purification works, has been granted to certain departments and commissions in other States.

All sewerage and drainage projects, which are required to be approved by any State commission or department, must also be approved by this Commission. One hundred and fourteen projects have been passed upon during the past year. The law should be amended so as to define with more exactitude the duties of the Commission in this regard.

INSPECTION OF DOCKS AND DAMS.

Supervision and inspection of all dams (excepting those forming a part of the State canal system) and all such docks as are by law placed under the supervision of the Conservation Commission, have been continued during the fiscal year.

A system of records has been devised by means of which ready reference can be made to the maps, plans and papers pertaining to each dam so far inspected.

In the course of the next two years, it is expected that the inspection records will include every dam of sufficient importance to make its possible failure a menace to life and property.

In the case of all new dams or reconstructed dams, the plans have been examined and approved, amended or rejected, as the merits of each case required.

Plans for sixty-four dams have been approved during the fiscal year. Forty-six other dams have been inspected and strengthening or improvements ordered or recommended.

Twenty-two dams have failed or gone out during the fiscal year. A few of these were large and important structures. Each of these dams, immediately following its failure, has been inspected, and the causes of failure, so far as possible, ascertained.

All of the dams which failed were constructed before the existence of the Commission and many of them were old, while a few were intended to be of modern and good design, in the construction of which the owners did not try to keep down cost, at the risk of disaster.

Had the plans of the dams, the failures of which were reported to the Commission, been inspected as is now done by competent engineers, under the Commission, it is believed that none of them would have failed.

The importance of supervision becomes more and more apparent as the dangerous condition of old dams is revealed by their failure in some cases and by the inspections in others.

HYDROGRAPHIC INVESTIGATIONS.

The Commission has amplified during the past year its investigations of the rainfall and stream flow in this State and the collection of data thereon.

In the year 1912 the stream gaging work was brought to a high degree of accuracy and efficiency by the introduction of automatic recording gages, stay wires, measurements through the ice covers of the streams and the establishment of permanent controls at a number of the gaging stations. The accuracy of the rainfall records has been increased by the installation of density buckets and snow tubes, which make it possible to obtain records of the snowfall with increased precision.

During the past year the following new stream gaging stations were established:

Hudson River at Spier Falls; Indian River at Indian Lake; Oswegatchie River at Newton Falls; Owasco Lake Outlet at Auburn; Deer River at Ironton; Little Tonawanda Creek at Linden; West Branch Oswegatchie River at Talcville.

In addition to the above, stream flow records were obtained from the following stations previously established by this Commission:

Ausable River at Ausable Forks; Bog River near Tupper Lake; Black River at Boonville; Canaseraga Creek at Dansville; Cattaraugus Creek at Versailles; Cedar River near Indian Lake; Genesee River at St. Helena; Genesee River at Jones' Bridge; Genesee River at Rochester; Hudson River at North Creek; Hudson River at Thurman; Hudson River at Mechanicville; Kushequa Creek at Sonyea; Moose River at Moose River; Moose River at Old Forge; Oswegatchie River at Ogdensburg; Orwell Creek at Altmar; Racquette River at Racquette Falls; Racquette River

at Piercefield; Racquette River at Massena Springs; Sacandaga River at Hope; Sacandaga River at Hadley; Sacandaga River at Blackbridge; Salmon River at Stillwater; Salmon River at Pulaski; Schroon River at Riverbank; St. Regis River at Brasher Center.

New rainfall stations were established in 1912 at Linden, Genesee county; Varysbury, Wyoming county; Warsaw, Wyoming county. Records were obtained from the following previously installed stations in addition to the 118 rainfall stations maintained by the U. S. Weather Bureau in this State:

Boonville, Faust, Forked Lake, Horse Shoe, Keep-a-wa, Knowelhurst, Morehouseville, North Creek, Old Forge, Potsdam, Rome, Wakely Dam, Ward's Creek, No. 4, Wanakena, Wells.

The accuracy and reliability of the hydrometric work in New York State is attested by the fact that during the past year representatives of two foreign countries were sent by the United States government authorities at Washington to Albany to inspect this work as it is being carried on in this State.

LEGAL BUREAU.

In addition to the litigations prosecuted by the Commission through the Attorney-General, a summary whereof is hereto appended, this Commission has been carrying on an important litigation to sustain its right and power, as successor to the State Water Supply Commission, to protect by river improvement proceedings the people of the State from danger to health, life, and property.

Prior to the creation of the Conservation Commission, the State Water Supply Commission had undertaken a plan for the improvement of Canaseraga creek and its tributaries between Mt. Morris and Dansville in Livingston county. Certain property owners had petitioned the Commission, under the provisions of the so-called River Improvement Act, to undertake a plan for the relief of the inhabitants of the Canaseraga valley from severe malarial conditions, destruction of crops, and the menace to the safety of the inhabitants from floods in the valley; and in accordance therewith an order had been made, establishing the improvement with assessments upon the property owners benefited thereby

for the purpose of carrying on the work. This improvement was actually being carried out and the work was proceeding for the evident betterment of conditions in the valley, when other property owners attacked the proceedings and the powers of the Commission, claiming not only that their property was not benefited, but that the whole scheme of the Commission was illegal and void.

The action of the Commission was reviewed by a writ of certiorari, and the proceedings thereunder were heard at Special Term of the Supreme Court in Livingston county, resulting in a decision against the State Water Supply Commission, setting aside the plan of improvement and its determination in establishing the so-called assessment district.

This was the condition of the litigation when the present Commission took office. An appeal was promptly taken by this Commission through its counsel to the Appellate Division of the Supreme Court, Fourth Department, with the result that a sweeping decision was rendered by the Appellate Division, reversing the decision at Special Term and sustaining the powers of the Conservation Commission to take property and levy assessments for the purpose of river improvement where health or safety demanded.

In its opinion rendered in November, 1912, the court held that the Commission had the broadest power and discretion to determine the necessity for the improvement in the interest of public health and safety, and that in the exercise of that broad discretion the Commission could carry out the improvement in such way and by such methods as would make the improvement most effective and the cost thereof most reasonable. The court not only sustained the power of the State to assess for benefits of such improvement on the lands of unwilling property owners, but held also that where the improvement would result in an increase in the value and productiveness of agricultural lands, such value and productiveness was a proper basis for assessment.

All of which is respectfully submitted.

GEORGE E. VAN KENNEN,
JAMES W. FLEMING,
JOHN D. MOORE,
Conservation Commissioners.

ALBANY, N. Y., *January* 15, 1913.

MEMORANDUM BY COMMISSIONER FLEMING.

I have subscribed my name to the above report as a member of the Conservation Commission, but I have done so with the express understanding that I do not approve of so much of the report as recommends a plan for the operation and distribution of hydro-electric power by the State itself.

While this plan may at some future time be proven wise and for the best interests of the taxpayers and citizens of the State, I have not been furnished with evidence which convinces me that the operations of the Ontario Hydro-Electric Power Commission, referred to in our report, have been a financial success. Until a detailed balance sheet of that Commission has been obtained I shall continue to withhold my approval of any plan which, without further investigation, may commit the State of New York to the expenditure of large sums of money, necessarily involving an increase in taxes and the expense of the State government.

JAMES W. FLEMING.

ADDENDA.

REPORT OF CONSERVATION BUREAU, ATTORNEY-GENERAL'S OFFICE, RELATIVE TO LITIGATIONS.

As provided by section 9 of chapter 647 of the Laws of 1911, the Conservation Commission transmitted to the Attorney-General all orders to bring actions, suits and proceedings which the Commission was authorized to institute and maintain, and transferred to him all the unfinished work of the legal department of the Forest, Fish and Game Commission as it existed prior to the enactment of the Conservation Law.

When the Conservation Commission took over the legal work of the Forest, Fish and Game Commission, there were pending one hundred and sixty actions which had been commenced prior to the enactment of the Conservation Law, many of which had been pending for years and had been brought by counsel designated by the Commission. These were transferred to the Attorney-General who was substituted as attorney of record for the State and proceeded to close the litigations without further delay. Of this large number of litigations, the Attorney-General, since the 12th day of July, 1911, has disposed of all except twenty-six which remain pending, and except fifty-three actions in ejectment involving title to land in township 15, Totten and Crossfield's Purchase, Hamilton county, which will shortly be concluded.

In addition to the litigations transferred to this bureau above mentioned, two hundred and thirty-seven orders to prosecute for various causes were transmitted by the Conservation Commission for action by the Attorney-General's office.

The following cases are pending:

Trespass	9
Ejectment	55
Fire	3
Fish and game	11

Top-lopping	1
Pollution	2
Action to set aside judgment	1

There have been disposed of by action during the period since taking over the legal work of the Forest, Fish and Game Commission on July 12, 1911, the following cases:

Ejectment	4
Trespass	28
Fire	7
Pollution	1
Fish and game	48
Top-lopping	9
On appeal	1
Action to determine claim to title	1
Action to set aside deed	2
Injunction	2
Partition	2

Many of the orders transmitted to the Attorney-General were settled or otherwise disposed of prior to bringing action thereon.

CONSERVATION DEPARTMENT.

Statement of Expenditures for the Fiscal Year Ending September 30, 1912.

For official salaries, Commissioners and deputies, secretaries, chief engineer and counsel.....	$58,053 76
For salaries of graded employees, auditor, stenographers, clerks, etc.....	9,662 34
For salaries of additional employees, assistant counsel, cashier, confidential agents, importation agents, publication bureau, inspector of docks and dams, confidential stenographers, etc.....	36,628 02
For traveling expenses and disbursements of Commissioners and deputies, counsel, secretaries officials, inspectors, experts and other employees..	13,986 43
For office expenses — rent, repairs, furniture, books, blanks, printing, postage, transportation, etc.	26,944 75
For temporary services, stenographers	2,363 70
For legal services, codifying and consolidating laws, and expenses	19,979 39
	$167,618 39

Division of Fish and Game.

Game Protection.

For salaries of chief protector, assistant and division chiefs and protectors	$99,801 33
For traveling expenses and disbursements of protectors and special protectors.....	59,274 38
For payment of moieties to complainants, justices, constables, attorneys, witnesses and court costs..	17,795 82
For printing game laws	7,200 00
For maintenance and hire of steamboats and launches patrolling State waters.....	2,779 27
For tags and tagging machines.....	1,500 00
For printing and advertising regulations.....	144 76
	$188,495 56

Hunters' License Bureau.

For salaries	$1,200 00
For expenses of county clerks, printing licenses, books, postage, etc.	5,111 20
	$6,311 20

Marine Fisheries Bureau.

For salaries of supervisor, deputy, clerks and protectors	$14,404 42
For office expenses — rent, postage, stationery and traveling expenses of officials and protectors	7,644 48
For surveying oyster lands	882 78
	$22,931 68

Propagation and Distribution of Fish and Game.

For maintenance of hatcheries and collection and distribution of fish and fry	$48,785 40
For salaries and expenses of fish culturist and foremen	13,018 09
For maintenance, expenses and salaries — game bird farm propagation	7,540 06
	$69,343 55

DIVISION OF INLAND WATERS.

For salaries of officials and employees	$13,972 50
For rent and office expenses	361 82
For appraisal and sale of surplus canal water	911 50
For developing water power	4,999 35
For hydrographic investigations	6,900 83
For surveys, investigations and river improvement	14,893 41
For investigating river structures	445 23
	$42,484 64

DIVISION OF LANDS AND FORESTS.

For salaries of officials and employees	$29,772 50
For land purchased in forest preserve and expenses connected therewith	7,384 56
For traveling expenses and disbursements of officials, foresters and employees	4,932 76
For salaries and expenses of fire patrol and laborers fighting forest fires	79,028 58
For surveying, and protecting State's title to land.	9,031 42
For repairs to docks and buildings, St. Lawrence reservation	852 31
For John Brown Homestead repairs	46 25
For expenses of tree nurseries, making growth studies and field tables, reforesting lands, publishing instructive pamphlets, etc.	32,680 93
	$163,729 31
Total expenditures	$660,914 33

CANASERAGA CREEK IMPROVEMENT FUND.

Balance in National Commercial Bank, Albany, N. Y., October 1, 1911	$189,997 68
Interest on deposits to October 1, 1912	5,094 82
	$195,092 50

Disbursements:

Paid Dewitt C. Stephens, contractor on construction	$31,588 13	
Manhattan Co., interest on bonds	10,000 00	
Services and expenses of engineers, attorneys and miscellaneous accounts	8,236 94	
		49,825 07
Balance in National Commercial Bank		$145,267 43

Summary of Receipts and Disbursements from Various Sources Exclusive of Regular Accounts with the State Comptroller for the Fiscal Year Ending September 30, 1912.

Receipts:

From fines and penalties collected	$25,307 28
From trespass on State land	2,291 98
From setting forest fires, fines	86 06
From failure to lop trees, fines	777 50
From tax on and rental of shellfish lands	23,676 34
From sales of seedling trees	8,422 80
From rebates on fire bills paid by State	12,274 09
From sales of hunters' licenses	152,052 55
From sales of net licenses	8,813 15
From sales of breeders' licenses	230 00
From refunds from various sources	45 45
From miscellaneous receipts	1,472 69
From sale of tags for foreign game	20,442 80
From telephone rentals	110 15
	$256,002 84

Disbursements:

By costs of collecting, fines and penalties	$851 11	
Refund account, tree sale orders	87 60	
Protested check	56 23	
Cash covered into State treasury	255,007 90	
		$256,002 84

ANNUAL REPORT

OF THE

DIVISION OF LANDS AND FORESTS

CONSERVATION COMMISSION.

DIVISION OF LANDS AND FORESTS.

ALBANY, N. Y., *January* 1, 1913.

To the Conservation Commission:

Herewith I transmit to you, pursuant to law, the annual report of the Superintendent of Forests.

Respectfully yours,

CHARLES H. JACKSON,

Deputy Commissioner.

ANNUAL REPORT

OF THE

FORESTRY BUREAU.

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REPORT OF THE FORESTRY BUREAU.

Hon. Charles H. Jackson, *Deputy Commissioner, Division of Lands and Forests, Conservation Commission, Albany, N. Y.:*

Sir.— I respectfully submit the following report relative to the affairs of this bureau for the year 1912.

The activities are grouped under the following heads, namely: Forest preserve, forest fire protection, forest products, practical forestry, State forest problems.

The Forest Preserve.

The protection and administration of an area of over one million six hundred thousand acres of land of varying character scattered over portions of sixteen counties, intermixed with approximately five times as much private property, consisting of nearly seven thousand parcels and bounded by over nine thousand miles of lines, is not an easy problem.

The fact that many lines are old, often indistinct, sometimes erroneous, and that rangers must be familiarized with the correct location of boundaries; that title to the area has been acquired in various ways, and that a careful examination of records by competent title examiners has been necessary, and is often difficult and tedious; the wide distribution, and sometimes small size of parcels, all tend to increase the labor of protection. The increased value and growing scarcity of timber induce trespass which, therefore, necessitates greater vigilance. The widely varying character of the land presents a multitude of problems. Some parcels are used, although this varies from the slightest extent to in some cases an effort to exercise control, use and ownership.

The work in connection with the administration of the forest preserve will be discussed under five headings, namely: Use, maintenance, classification, boundaries, titles.

USE.

Occupancy.

During the past two and one-half years there has been a determined effort made to secure a complete record of the nature and extent of all cases of occupancy in the forest preserve. As a result 592 such reports have been filed in this office, and supplemental information has been systematized and catalogued. A blank form of "Disclaimer of Title" to the land used or occupied has been prepared and approved by the counsel, and submitted to the occupants for execution. In no case has any promise or threat been made as to future tenancy, and a large number have duly executed these disclaimers, all of which have been placed on record. In some instances the parties have refused to execute the disclaimer, and as fast as the necessary data are compiled, a report, with the accompanying facts, has been transmitted to the counsel of this Commission for his recommendations. Other cases are in preparation.

Trespass.

The decrease in the number of trespasses, and the value of material removed, has been both marked and gratifying. The following tabulation shows the number of cases and value of timber therein which have been reported to this office as having been committed during the past four years. This table indicates in a striking manner the progress which has been made in this direction.

Comparison of Trespass Cases 1909–1912.

YEAR	Number of cases	Computed value of material	Average damage per trespass
1909	83	$39,063 07	$470 64
1910	104	20,054 29	192 82
1911	46	1,499 20	32 59
1912	27	502 23	18 60

There are cases the final report of which has not yet been received at this office, but they are few, and the damage is small. Only three of the cases reported as committed during 1912 amounted to over $25 each. In one case about $200 worth of

timber was cut, but the trespasser did not secure the benefits because the logs were seized by one of our rangers, drawn to a mill, sawn into lumber, and the material used to build cabins for the use of men employed in protecting forest plantations. The guilty party was arrested, held for the grand jury, has since been indicted, and is waiting trial. The other trespasses were largely the result of mistaken location of boundary lines, or the timber was cut on account of a claim of title to the land.

If sufficient lines are established, and the forest rangers, who are intrusted with the field work, become familiar with the boundaries of the State's property, and trespassers learn that the removal of timber from State land is an unprofitable operation, it is possible that an even better showing can be made.

Roads.

During the year several applications have been filed in this office for temporary roads across State land. Each case has been fully investigated, and when it was found that the use of a road would not cause the State to suffer injury, and that there was an absolute necessity for the same, recommendations have been made that a permit be granted by the Commission under proper safeguard.

Camping.

The increased popularity of our mountain resorts has brought a larger number of people into the forest preserve, and therefore it has served a wider function, but this increased use has produced a greater forest fire danger.

At the present time there are no restrictions as to camping on State land in the forest preserve, except that no permanent structures may be built (tents with a board floor are permitted); and that all persons must properly clear a space where any fire is built, and see that the same is entirely extinguished before leaving.

There are, approximately, four hundred miles of suitable camp sites on the shores of lakes and ponds owned by the State in the Adirondack section alone. Many people who frequent the Adirondacks and do not own camps of their own are desirous of the opportunity of leasing camp sites. This would doubtless make the

region still more popular. Numerous campers prefer wooden structures or portable houses to tents, and the indications are that they are willing to pay a reasonable rental for camp sites. It is argued that as soon as a person becomes a lessee of property he has a greater interest in the protection of that locality than has the transient, and that, therefore, leasing of camping sites, under proper restrictions, would greatly reduce the present fire hazard, and, on the other hand, result in establishing an auxiliary volunteer fire protective force. The revenue which would be derived from this source by the State would be considerable, and could be properly spent in securing better fire protection.

The present State Constitution prohibits the leasing of camp sites, and, on account of the importance of the question, the people should consider these problems carefully and thoroughly in order that, when the time for a constitutional change arrives, they may act intelligently.

Management.

The State of New York is probably the largest forest land owner in the Eastern States. The forest preserve which it has acquired embraces an area one-half as large as the entire State of Connecticut, or about one and one-quarter times as great as the State of Delaware.

The State Constitution adopted in 1894 prohibits the removal, sale, or destruction of timber growing on this extensive area. During the two decades, since the Constitution was adopted, important economic, industrial and administrative changes have taken place. At that time there was no appreciation of the importance of scientific forestry; there was not a single American school of forestry, and probably not more than five professional foresters in the whole country. The forests were then considered as something whose maximum quantity was fixed and not capable of reproduction and increase by growth as is now known and admitted to be the case.

The area has increased from 720,774 acres to more than one million six hundred and fifty thousand acres; our population has increased from six million people to nine million. It is therefore seen that the application was made at a time when there was but 50 per cent. of the present area, and a lesser population, and

furthermore at a time when the quantity of material which was tied up was but a small part of the whole, while at the present time the standing timber on State land is a large part of our forest resources. It is estimated that the amount of standing timber in the forest preserve region in 1894 was approximately forty billion feet board measure, and that this quantity has decreased until at present there is not over twenty-five billion feet. At that time approximately four billion feet, or 10 per cent., were under State ownership; at the present time the material on State land is about twelve billion feet, or nearly 50 per cent. of the whole. The change in economic development of the State, and the decrease in our forests resources, is also indicated by the fact that the lumber cut in this portion of the State at that time was approximately 1 per cent. of the total stand, while at the present time it is as high as 10 per cent.

It has been said that the framers of the constitutional prohibition desired to take radical action in order to insure the preservation of the State forests. There had been previously a period of abundant trespass and the administration had not provided proper protection.

From this standpoint it is perhaps possible to conceive the purpose of the framers of the constitutional prohibition, and that they did what was, perhaps, then for the public good. The changes which have taken place have operated to limit the State in its work, and actually to prevent the proper care, preservation and improvement of the resources which they were so anxious to perpetuate.

A large number of forestry schools have been established and technical foresters are available. Private land owners are appreciating the possibilities of better forest management and are applying these ideas in handling their lands, while the State is not deriving any revenue, and is securing only indirect benefits from this large area.

MAINTENANCE.

The extended area which has been acquired, known as the State Forest Preserve, is practically a protective forest. The benefits which the people and the State derive therefrom are indirect. It is difficult to compute the initial cost of this property because

the title to a large area has been acquired through tax sales and other sources which would necessitate an extensive search and compilation. It is fair, however, to say that the State in its acquisition spent approximately four million dollars. The interest on this investment at five per cent is two hundred thousand dollars per annum, and the taxes are about one hundred and fifty thousand dollars per year; the cost of fire protection and administration is nearly fifteen thousand dollars more; there is, therefore, a total carrying charge of not less than three hundred sixty-five thousand dollars per year.

The movement to secure better management, wiser expenditure, increased income and greater efficiency in the management of State affairs is of the utmost importance. The State of New York probably never made a better or wiser investment than the acquisition of the forest lands in the Adirondack and Catskill regions. The value of this property has been variously estimated and is worth many times its cost. The present expenditures by this Commission for protection and administration are probably not more than one-half of a mill per dollar of valuation, which is an insignificant premium for the protection of this valuable property. It would not, therefore, be a wise policy for the State to reduce the expenditure for fire protection or administration, but, on the other hand, an increase is necessary. If this property is intelligently and safely handled it is possible to make the same not only self sustaining but revenue producing. There is the possibility of securing all the advantages which are now derived from a protective forest standpoint, and in addition a large income to the State if this area is placed under proper, honest forest management.

CLASSIFICATION.

Mortgage Lands.

The State has acquired title to over eight thousand acres of land in the Forest Preserve counties through the foreclosure of mortgages given to Loan Commissioners. The statute provides that if this land was wild at the time of foreclosure it became a part of the Forest Preserve, and therefore, under our jurisdiction, but if it was not wild land at that time then it is not a part of the Forest Preserve, and is in the care of the State Comptroller. A

systematic effort is being made to secure the necessary data in order that the classification of these lands may be made. The result will not only determine responsibility for administration, but solve the question as to whether or not they may be leased or sold, and also whether they are subject to taxation.

Valuation Surveys.

There is urgent need for a careful examination and report on the State's holdings. This information may best be secured by making forest valuation surveys. It is certainly just as important for the State to know the amount, location, nature and value of its holdings, as it is for a large corporation to take an inventory of its property. At the present time information of this nature is of the most meagre kind. These surveys would show not only the timber on State land, but the amount of species by diameter classes for different areas and types; they would not only give information useful to the State and the office charged with the administration of the property, but afford necessary facts desirable from the standpoint of taxation, location of observation stations, and better forest fire protection, and secure a delineation of the areas necessary to be reforested. The forest rangers would be employed to a certain extent upon this work and they would be given useful and sufficient instructions, thereby making their services more valuable. Private land owners would necessarily become interested and the possibility of securing a more economic management of private forest property would result. Desirable data relative to game protection and water storage would also be secured. The information would be useful in so many ways that the expense would be saved in a very short time, and instead of having incomplete and only partial data, a systematic survey with complete knowledge of conditions would be secured.

BOUNDARIES.

The first principle of forest protection or management is the definite location and demarcation of the boundaries of the property. The vast extent of the property lines and the fact that many of them are so old, makes the work not only extended but difficult. The limited appropriations prevent systematic work and necessitate confining the surveys to those areas where danger from

trespass is greatest, or where adjacent land owners intend to lumber in the immediate future and request a joint survey. A consistent effort has been made to systematize the work as far as possible and furthermore secure permanent results. It has been the custom to arrange with adjacent land owners for a co-operative survey, each party to pay one-half the expense, and when the work is completed, checked, and lines definitely established, then an agreement fixing the location is effected.

Progress Map.

In order to secure the best results and prepare permanent records a progress map system has been instituted. An outline map of the Adirondack region showing the boundaries of the larger patents, purchases, tracts, etc., with the chief subdivisions, has been started, and the entire region divided into small quadrangles. The former map is on a small scale while the latter is made in sufficient detail to show the complete demarcation of all lines, corners and other requisite information. This work will lead to permanent results, and we believe make the information most available.

The field work is, as far as possible, done during the summer, while the mapping is performed during the winter months.

Old Records.

The fact that large areas were patented by the State, and the allotment subsequently made by surveyors in the employ of the patentees, and furthermore that the maps and field notes made by these surveyors are, in some cases, not a matter of record, has been a great handicap. It has been necessary to reconstruct maps and field notes by searching deeds and old conveyances, also procuring fragmentary records from old surveyors and heirs of former owners. Much progress has been made in this direction, and we have the beginning of a valuable collection of this nature. Many original maps and papers have been copied. The State Engineer kindly placed at our disposal the field notes and other data belonging to the "Office of State Land Survey." It will be necessary to continue this work in order to secure the necessary data for the preparation of the maps and information for the use of our surveyors in locating lines of the State's property.

Surveys.

The old lines are often obliterated by the changes due to lapse of time during the century or more since they were originally run. In the meantime in some localities surveys have been made that were not correct. The so-called surveyors did not find the original lines, either on account of the secular change in the needle, local attraction, poor measurement, improper starting point, or even in some instances, a gross case of incompetence or intent on the part of the surveyor.

A larger appropriation should be available for this work. The location of the boundaries will settle present and future disputes, and make the protection of the State's interest possible. A number of our trespasses are probably due to erroneous or indistinct location of lines, and in order to prosecute a trespass a survey must be made. It, therefore, seems better to run the line and protect the property than be required to do the work later in order to prepare for litigation. The passage of time tends to obliterate the old marks and monuments, and thereby the expense of the work is increased. The delay not only causes a loss and decrease of efficiency in administration but also defers work which must be done eventually, and if later, at an increased cost.

TITLES.

The Conservation Law which was passed at the last session of the Legislature provided that the abstracts of searches of title and certified copies of original deeds be filed in the office of this Commission. These papers have heretofore been filed in the office of the State Comptroller. They are not used by the latter but are very important to us in order that we may secure the necessary description and information required to administer the various duties relative to the forest preserve.

Steps should also be taken to prepare the copy for a revised edition of the "Land List."

Abstracts.

A large amount of work must be done searching records in order to get a complete description of the numerous tracts of State land, and the necessary data for determining their true location. A

great many parcels are not completely described, or have exceptions which cannot be located without an examination of the public records. There should be not less than two competent title examiners assigned to this Bureau. This work should be transferred from the Attorney General's Office to this Bureau, and the examination and report on titles not only made here where the papers to which reference must be had are filed, but made before prospective cases are reported to the counsel of your Commission. These searches are often necessary before making surveys to locate the State's lands.

FOREST FIRE PROTECTION.

The Commission under the law is charged with the duty of protecting the forests, which are located in ninety-six towns in the central portions of the Adirondack and Catskill Preserves from forest fires. The protection of forests in towns other than those above mentioned is a town matter, although this Commission is enforcing a State-wide law relative to the clearing of railroad rights of way, and the maintenance of proper equipment in locomotives.

NEW LAWS.

The Lands and Forest portion of the Conservation Law (chapter 444 of the Laws of 1912) was signed by the Governor on April 17, and has therefore, been in effect during practically all of the present fire season. The new law did not materially alter the organization of the fire fighting force although it changed the designation of some of its members. The Adirondack towns are divided into four districts, while the Catskill towns are embraced by one district, each of which was formerly in charge of a Superintendent of Fires, now called a District Forest Ranger. The employees formerly termed fire patrolmen are now called Forest Rangers. The force of auxiliary fire fighters, who serve only during emergency, and were previously designated special fire patrolmen, are now called Fire Wardens. The force of railroad fire inspectors was increased by the addition of two, and the State divided into two districts with a chief inspector for each district. There are other changes in the fire law which will be referred to later in this report.

FOREST FIRES.

Although the year 1912 has been marked by much more rainfall than the previous year, there was however, a long period of dry weather in certain portions of the State during the months of June and July. The fire danger in portions of Warren, Essex and Franklin counties was unrelieved by any rainfall for a period of many weeks at this time, and residents of those sections stated that they had never seen the country as dry as it was during the latter part of June. The excellent showing in fire protection this year redounds greatly to the credit of our fire fighting force. The rangers have transmitted to this office complete reports of every forest fire which has occurred in the area under our protection, embracing seventy-seven towns in the Adirondack Preserve and nineteen towns in the Catskill Preserve, the aggregate acreage of this being approximately seven million two hundred thirty-two thousand acres. The data contained in these reports have been compiled in two tables, one of which gives the forest fires and losses for the year by counties, and the other by causes. They are transmitted herewith.

A statement of the forest fires occurring in a given region or a classification of reports according to causes is of utmost importance in planning a system of future fire protection for a specific region or in an endeavor to reduce consequent loss by eliminating the cause if possible.

The number of forest fires which occurred during the past year was three hundred eighty-three, which was but sixty-five per cent of the number which occurred in 1911. The efficiency of the fire fighting force is indicated by the exceedingly small number of large fires. Out of the total number of fires reported, all except fifteen were checked before they had burned over one hundred acres. The total area burned during the current year is only twenty per cent of that for 1911, and the consequent expense of fighting fires has been reduced by more than three-fifths. The damage done by fires decreased approximately seventy-five per cent, or from forty-three thousand to about eleven thousand dollars. Furthermore, the number of acres of virgin timber land which was damaged by fire was but one hundred eighty-five acres. Of the total area under protection less than seven thousand acres or one-tenth of one per cent suffered from fire.

Summary of Forest Fire Losses, 1912, by Causes.

CAUSE	Number of fires	Total acreage burned	Acres Private Land Burned				Acres State Land Burned				Value of standing timber destroyed	Value of logs, lumber, etc., destroyed	Value of buildings, fences, etc., destroyed
			Virgin timber	Second growth	Brush	Waste	Virgin timber	Second growth	Brush	Waste			
ADIRONDACKS.													
Locomotives	72	292	17	110	111	53	.....	.....	1	.....	$580	.....	$10
Smokers	52	675	31.5	154	378	104	.5	3	.5	3.5	1,232	$75	75
Unknown	44	2,223	27	201.5	1,259	620.5	25	51	5.5	34	1,095	2,194	85
Fishermen	36	738	13	357	213	124	1	2	.....	27	972	30	.....
Lightning	32	209	.....	23.5	129	13.5	.5	2	40	.5	261	6	.....
Campers	32	151	1.5	5.5	110	1.5	1	3	1.5	27	133	.....	50
Incendiary	19	196	.5	72	95.5	7	.....	2	19	.....	710	30	200
Burning brush	10	246	30	15	187	.....	3	2	9	9	600	40	.....
Hunters	8	269	.....	42	55	15	2	154.5	.....	.....	185	.....	35
Carelessness	9	110	7	13	30	60	.....	.....	.....	.....	55	45	30
Clearing land	5	51	.....	4	45	2	.....	.....	.....	.....	.....	.....	.....
Berry pickers	6	7	.....	2	.....	.....	.....	4	1	.....	10	.....	.....
Burning buildings	5	183	.....	.....	8	.....	.....	.....	176	.....	.....	.....	.....
Children	4	100	6	70	1	23	.....	.....	.....	.....	200	.....	75
River drivers	2	5	.....	1.5	.....	3.5	.....	.....	.....	.....	3	.....	.....
Bee hunters	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blasting	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steam roller	1	1	.....	.....	.....	.....	.....	1	.....	.....	5	.....	.....
Sawmill	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	340	5,456	133.5	1,071	2,621.5	1,027	33	222.5	246.5	101	$6,041	$2,420	$560
CATSKILLS.													
Locomotives	21	177	.....	3	152	20	.....	.....	2	.....	.....	.....	.....
Smokers	7	109	16	23	65.5	3	.5	.....	.....	.....	$369	.....	.....
Unknown	4	150	.....	77	64	10	.....	.....	.....	.....	260	$100	$15
Fishermen	1	14	.....	.....	.....	.....	.....	14	.....	.....	35	.....	.....
Lightning	2	20	.....	2	12	6	.....	.....	.....	.....	20	.....	.....
Incendiary	1	100	.....	30	40	30	.....	.....	.....	.....	150	.....	.....
Hunters	2	40	.....	27	13	.....	.....	.....	.....	.....	110	.....	.....
Carelessness	1	1	.....	1	.....	.....	.....	.....	.....	.....	10	.....	.....

Clearing land	2	21	.....	.....	20	1	.....	.....	.....	.....	.....	1,050	.....
Berry pickers	1	900	.....	250	350	300	.....	.....	.....	.....	200	.....	.....
Bee hunters	1	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	43	1,534	16	415	716.5	370	.5	14	2	.....	$1,154	$1,150	$15

TOTALS.

Adirondacks	340	5,456	133.5	1,071	2,621.5	1,027	33	222.5	246.5	101	$6,041	$2,420	$560
Catskills	43	1,534	16	415	716.5	370	.5	14	2	.....	1,154	1,150	15
Grand Totals	383	6,990	149.5	1,486	3,338	1,397	33.5	236.5	248.5	101	$7,195	$3,570	$575

Summary of Forest Fire Losses, 1912, by Counties.

COUNTY	Number of fires	Total acreage burned	Total expense of fighting fires	Acres Private Land Burned				Acres State Land Burned				Value of standing timber destroyed	Value of logs, lumber, etc., destroyed	Value of buildings, fences, etc., destroyed
				Virgin timber	Second growth	Brush	Waste	Virgin timber	Second growth	Brush	Waste			
ADIRONDACKS.														
Clinton	39	549	$575 92*	19	169	297	64	.....	.....	.....	.....	$703	.....	$100
Essex	64	610	1,365 97	2	76	33	287	25	6	179	2	700	$2,106	125
Franklin	45	1,777	1,706 26	51	224	1,266	140	3.5	54	.5	38	1,665	.....	125
Fulton	4	22	59 25	1	.....	9	12	.....	.....	.....	.....	10	.....	50
Hamilton	28	272	610 66	.5	41	.5	.....	.5	150.5	52	27	384	.....	.....
Herkimer	30	366	606 96	5	47	229	51	1	2	.....	31	276	10	35
Lewis	8	98	307 12	.....	30	42	26	.....	.....	.....	.....	25	.....	.....
Oneida	2	22	51 75	.....	11	11	.....	.....	.....	.....	.....	75	.....	.....
St. Lawrence	22	551	731 65	1	7	215	326	.....	.....	2	.....	50	40	.....
Saratoga	19	297	61 40	35	168	43	41	.....	.....	10	.....	710	.....	25
Warren	71	814	1,255 54	14	284	437	60	3	10	3	3	1,338	264	100
Washington	8	78	175 80	5	14	39	20	.....	.....	.....	.....	105	.....	.....
Total	340	5,456	$7,508 28	133.5	1,071	2,621.5	1,027	33	222.5	246.5	101	$6,041	$2,420	$560
CATSKILLS.														
Delaware	20	210	$113 05	1	13.5	175	19.5	.5	.....	.5	.....	$25	$100	.....
Greene	6	7	32 50	.....	2.5	1.5	1.5	.....	.....	1.5	.....	30	.....	.....
Sullivan	2	25	126 70	.....	5	20	.....	.....	.....	.....	.....	50	1,050	.....
Ulster	15	1,292	1,300 72	15	394	520	349	.....	14	.....	.....	1,049	.....	$15
Total	43	1,534	$1,572 97	16	415	716.5	370	.5	14	2	.....	$1,154	$1,150	$15
TOTALS.														
Adirondacks	340	5,456	$7,508 28	133.5	1,071	2,621.5	1,027	33	222.5	246.5	101	$6,041	$2,420	$560
Catskills	43	1,534	1,572 97	16	415	716.5	370	.5	14	2	.....	1,134	1,150	15
Total	383	6,990	$9,081 25	149.5	1,486	3,338	1,397	33.5	236.5	248.5	101	$7,195	$3,570	$575

* This amount includes $217.16 paid this year for expenses of 1911 fires.

Causes.

The total number of fires occurring in both the Adirondack and Catskill regions is, classified by causes, as follows:

Locomotives	93
Smokers	59
Unknown	48
Fishermen	37
Lightning	34
Campers	32
Incendiary	20
Burning brush	10
Carelessness	10
Hunters	10
Clearing land	7
Berry pickers	7
Burning buildings	5
Children	4
Bee hunters	2
River drivers	2
Blasting	1
Steam-roller	1
Saw-mill	1
	383

The railroad locomotives are still responsible for more fires than any other agency, but it should be said in this connection, however, that no railroad fire this year burned over an area exceeding forty acres and that most of the land which was damaged by these fires was denuded or brush land on the outskirts of the forest proper, so that a comparatively small amount of damage from this source has been done. The expense incurred by this department in connection with fighting railroad fires has been charged to the railroads responsible for the same, and these bills have for the most part been promptly paid. The decrease in severity of railroad fires is due to the enforcement of the law requiring proper cleaning of the rights of way and the application of proper protective devices on locomotives.

The carelessness of smokers in dropping lighted matches, cigar or cigarette stubs was the second greatest cause of fires during the year. Our rangers were instructed to interview as many as possible of the persons who entered the woods and explain to them the necessity of caution with regard to the use of matches, etc. A great many fire notices have been posted, which also call the attention of the careless to the danger of fire from this source.

The number of fires caused by campers and fishermen is still great, and it is exceedingly difficult to impress upon persons not familiar with the woods, and who enter the mountains for only a short time each year, the great necessity for caution, and the ease with which fires may be caused. Fishermen frequent the woods chiefly during the early spring when the fire hazard is great. During this season the dead leaves and dry grasses easily catch fire, and, on account of the absence of green leaves, the fire spreads rapidly.

Comparison of Forest Fires 1909–1912.

YEAR.	Number of fires	Total acreage burned	State land burned	Total damage	Average area burned per fire	Average damage per fire	Number observation stations
		Acres	*Acres*		*Acres*		
1909.....	307	11,759	198	$23,126	38	$75 33	15
1910.....	277	12,680	1,570	17,803	46	64 00	20
1911.....	506	37,909	6,794	43,664	73	86 00	36
1912.....	383	6,990	629	11,340	18	30 00	49

It seems desirable that some legislation be enacted which will require people who camp in the woods and use fire, to secure permits in advance in order that their names and addresses and places of camping may be known, and thus responsibility fixed. These people are enjoying the free use of millions of dollars worth of property, and some of them do not in the least appreciate the consequences of forest fires.

The activity of the rangers during the past summer has been indicated by the fact that they have extinguished a number of camp fires which have been left burning. Fortunately most of these fires were discovered before they had burned over any considerable area.

Lightning, which was the cause of a large number of fires last year, did not do as much damage this year. It is, of course, impossible to prevent the occurrence of fires from this source, but any which start are quickly observed by the mountain stations.

There is a gratifying decrease in the number of fires set by berry pickers, or started maliciously by persons who desire to avenge themselves for fancied wrongs. The indictment of two or three persons for offenses of this character has had, we believe, a salutary effect in preventing incendiary fires.

Clearing Land.

Prior to the passage of the Conservation Law the setting of fires to clear land and burn brush in fire towns was restricted to certain seasons of the year. During the fall and spring months, fires could not be set for this purpose, and throughout the summer season they could be set only under permits. Experience indicates that the best results cannot be obtained under a law which attempts to designate by date the exact period of the year during which it will be safe to set fires, or which is based on the principle of determining, in advance, the weather conditions. The Conservation Law provides that burning must not be done at any time of the year except under a permit issued by a forest ranger; but, on the other hand, such burning may be done during any season, provided a permit is first secured. The rangers have been impressed with a proper sense of responsibility for any and all damage which may be caused by fires set under permits granted by them. Fires which were reported as caused by setting fires to clear land, or burning brush, were nearly all in violation of the law, and reports have been transmitted to the Commission.

Efficiency of Observation Stations.

The fact that so many fires have burned over only small areas is due to their being discovered promptly. These fires were discovered by observers on mountain stations, and thus, by means of this information and the telephone, we were able to get men to the fires quickly. There are many cases which might be cited, but the following is a good example: During the dry period of July, about noon one Sunday, a fire was discovered by the observer

on Adams Mountain. This fire originated in one of the most inaccessible portions of the Adirondack forests, but in spite of this fact a fire warden with a small force of men reached there within two hours, and by five o'clock the following morning the ranger was on the ground with a large force of men, and the fire was controlled before it had burned over more than five acres. The land on which this fire occurred had been lumbered within recent years and there was a large amount of slash on the ground. If the observation station had not been there it is probable that thousands of acres of timber land would have been burned over before the fire could have been checked.

A double check has been maintained upon the observers and few cases of neglect of duty have been found. The accompanying table which gives a list of fires reported from each mountain station during the past year demonstrates beyond question the value of the mountain stations as an aid in the fire fighting organization. It will be noted that the number of fires reported from the mountain stations is greater than the actual number of fires. This is accounted for by the fact that in some cases the same fire has been observed from more than one station.

List of Mountain Stations in Operation in 1912 *and Number of Fires Reported from Each.*

STATION.	Fire district.	County.	Town.	Fires reported, 1911.	Fires reported, 1912.
Adams*.....	2	Essex.....	Newcomb....	.....	7
Ampersand.....	1	Franklin.....	Harrietstown..	1	6
Arab.....	3	St. Lawrence..	Piercefield....	.....	3
Bald.....	3	Lewis.....	Croghan.....	18	19
Balsam Lake.....	5	Ulster.....	Hardenburg...	3	4
Beaver Lake.....	3	Herkimer.....	Webb.....	11	3
Belfry*†.....	2	Essex.....	Moriah.....	.....	7
Bellayre.....	5	Ulster.....	Shandaken....	18	5
Black.....	2	Washington...	Dresden.....	15	14
Blue.....	3	Hamilton.....	Indian Lake..	.....	1
Boreas.....	2	Essex.....	North Hudson	1	8
Cat.....	3	St. Lawrence..	Clifton.....	11	14
Catamount.....	3	St. Lawrence..	Colton.....	.....	6
Cathead.....	4	Hamilton.....	Benson.....	18	35
Crane.....	2	Warren.....	Johnsburg....	.....	20
DeBar*†.....	1	Franklin.....	Duane.....	.....	4
Dunn Brook.....	3	Hamilton.....	Indian Lake..	8	.....
Fort Noble.....	4	Herkimer.....	Wilmurt.....	.....	21
Gore.....	2	Warren.....	Johnsburg....	11	10
Hamilton.....	4	Hamilton.....	Lake Pleasant.	22	32

* Not installed in 1911.
† In use only part of season of 1912.

Photo by W. G. Howard.

Forest Fire Observatory, Cat Head Mt., Hamilton Co.

Photo by W. G. Howard.

FOREST FIRE OBSERVATORY AND CABIN, MAKOMIS MT., ESSEX CO.

STATION.	Fire district.	County.	Town.	Fires reported, 1911.	Fires reported, 1912.
High Point*†	5	Ulster	Wawarsing	.....	25
Hunter	5	Greene	Jewett	7	8
Hurricane	1	Essex	Keene	22	23
Kempshall	3	Hamilton	Long Lake	13	8
Loon Lake*†	1	Franklin	Franklin	.....	4
Lyon	1	Clinton	Saranac	30	35
Makomis	2	Essex	North Hudson	1	5
Mohonk*	5	Ulster	New Paltz	.....	3
Moosehead	3	St. Lawrence	Colton	7	6
Moose River*†	3	Lewis	Lyonsdale	.....	4
Mt. Morris	1	Franklin	Altamont	22	10
Ohmer	4	Saratoga	Day	.....	37
Owlshead	3	Hamilton	Long Lake	1	10
Pharaoh	2	Essex	Schroon	11	21
Poke-O-Moonshine*†	1	Essex	Chesterfield	.....	7
Prospect	2	Warren	Caldwell	16	16
Rondaxe*	3	Herkimer	Webb	.....	2
St. Regis	1	Franklin	Santa Clara	16	8
Slide*†	5	Ulster	Shandaken	.....	1
Snowy	4	Hamilton	Indian Lake	17	27
Stillwater*	3	Herkimer	Webb	.....	5
Swede*	2	Warren	Hague	.....	16
Tomany*	4	Hamilton	Arietta	6	5
Twadell	5	Delaware	Hancock	8	4
Vanderwhacker	2	Essex	Minerva	26	26
Wakeley	4	Hamilton	Lake Pleasant	.....	1
West	3	Hamilton	Long Lake	3	.....
Whiteface	1	Essex	Wilmington	28	10
Woodhull	3	Herkimer	Wilmurt	.....	8
Total	.....	.....	.....	365	554

* Not installed in 1911.
† In use only part of season of 1912.

PERMANENT IMPROVEMENTS.

The present fire protective system has been in effect since May, 1909, and during this period a rapid expansion of the system has taken place. It was at first necessary, on account of the large amount of work to be done with limited appropriations, to build and equip stations at minimum cost. During the past year an effort has been made to secure more permanent equipment.

Telephone Lines.

A large number of the telephone lines which were constructed during the first year of the present system have been rebuilt. All the lines established during the year have been constructed in a stable manner. The following table shows the total number of miles of telephone lines built by this department, together with the number of miles constructed during the past year:

FIRE DISTRICT.	Total miles telephone lines, December, 1912.	Miles built during 1912.
Northeastern Adirondack district	35	11
Southeastern Adirondack district	63	15
Western Adirondack district	47	12
Southern Adirondack district	66	12
Catskill district	16	8
Total	227	58

The above table shows that the total mileage of telephone lines in all the districts was increased by 34 per cent. during the year.

New Stations.

Thirteen new stations have been installed during the year. These stations were as follows:

Station.	County.
Adams	Essex
Belfry	Essex
Debar	Franklin
High Point	Ulster
Loon Lake	Franklin
Mohonk	Ulster
Moose River	Lewis
Poke-O-Moonshine	Essex
Rondaxe	Herkimer
Slide	Ulster
Stillwater	Herkimer
Swede	Warren
Tomany	Hamilton

This increases the number of stations from thirty-six to forty-nine. It has in each case been necessary to construct suitable telephone connection.

Cabins.

When the first observation stations were installed by the Department the observers were supplied with tents in which to live, and small rainproof wooden boxes for their telephone in-

struments. The weather conditions on the mountain tops are, however, decidedly severe, even during the summer months, therefore, the life of a tent, which is in constant use in an exposed situation, is usually not more than two years. The experience gained in this connection demonstrated the need of a more comfortable and permanent form of shelter. Cabins have been constructed of logs or lumber as fast as funds could be spared for this work. At the present time thirty-two of the forty-nine mountain stations are equipped with cabins; twenty-one of them are built of logs and eleven of lumber or boards; twenty of these buildings have been erected during the past season. In addition three camps have been erected for use of watchmen on plantations.

Roads and Trails.

In the more undeveloped portions of the Forest Preserve there are large blocks of timber land not accessible by existing highways. If fires should occur in certain of these places, it would be exceedingly difficult to get men and provisions there promptly. It is therefore advisable to clear out trails in order to render these areas more accessible for expedition in patrolling or securing men and supplies. Therefore, about one hundred and seventy miles of trails have been constructed and maintained.

The trails leading to the mountain observation stations have been cleaned out and greatly improved. This work has been done by the observers during wet weather or when their continued presence was not required at the stations, thus making the stations an attraction to tourists, and also relieving the men of the monotony of observation duties.

CO-OPERATION UNDER THE WEEKS LAW.

In accordance with the provisions of the Weeks Law, the U. S. Department of Agriculture entered into a co-operative agreement with this Department, and we received approximately four thousand dollars which was expended in salaries of observers on mountain stations within the limits of the Hudson and Delaware watersheds. This money was of great assistance and served to eke out the inadequate appropriations for fire protective work.

An order was issued by the Postmaster-General directing all

rural free delivery carriers to report any fires which came to their notice to members of our field force. This has already been of some assistance; but its full value is yet to be determined.

RAILROADS.

The first Forest Fire Law provided for the clearing of rights of way and equipping locomotives with proper devices to prevent the escape of fire. This law has been modified and improved in subsequent legislation. It was not until 1904 that provision was made for the employment of men to look after the enforcement of this law, and then only in the Forest Preserve sections. The Conservation Law enacted at the last session of the Legislature makes this provision State-wide and applies not only to railroads operating as common carriers, but also to logging railways.

The new law provided for a division of the State into two districts and the appointment of a chief inspector for each district. A line of division was established running across the State approximately from Albany to Buffalo. The main line of the New York Central system from Albany to Buffalo and all lines north of it were designated as the Northern District, while all of the roads south of that line, including Long Island, were assigned to the Southern District.

Section 103 of the Conservation Law provides that every railroad company and every person operating a railroad in any part of the State shall properly clean its right of way and shall provide each locomotive with practical and efficient spark-arresting devices, and furthermore, that said devices shall be approved by the Public Service Commission, and shall at all times be maintained in good repair. In order that the work might be properly handled, this Commission requested the Public Service Commission to inform us what requirements they would demand and approve on the various lines operating in this State, and in compliance with this request they notified us that enforcement of the order which they had promulgated in 1909, relative to the use of coal burning locomotives in the Adirondacks, would be required, except that overflows need not be piped into ash pans except on certain lines where forest property of much consequence was subject to fire. All the railroads operating in the State were promptly

supplied with a copy of the order of the Public Service Commission, and our force was instructed to inspect engines and secure a compliance with the law.

The repairs and changes necessary to be made to engines in order to have them comply with the law falls under two heads: First, minor defects, that is, those imperfections due principally to failure to maintain existing equipment, and second, defective design, which includes defects of design or type, such as spark-arrester netting with too large a mesh, or large openings around the ash pans not guarded in proper manner. The minor defects can, as a rule, be repaired in the roundhouses, while defective design must be corrected in the shops when heavy repairs are made.

The inspection of thousands of miles of right of way and many thousands of engines of various designs and types at numerous places has kept our force very busy.

Conferences have been held between our chief inspectors and the superintendents of motive power or other officials of several railroads. As a result a better understanding has been reached and the railroad officials have submitted drawings illustrating proposed changes in designs for the approval of the Public Service Commission. This enables the companies to go ahead with their work with a feeling of security. The improvement in regard to making repairs, rapid advances in change of design where necessary, and the hearty co-operation of nearly all the railroads in the State, have brought about a most satisfactory showing for the first year of operation.

TOP LOPPING.

The codified Forestry Law contained the original provision requiring the lopping of tops of all coniferous trees, unless trees were cut for use with the branches on, in any of the fire towns. The only difference between the present law and the former one is, First: That the application is restricted to the fire towns and not to the entire forest preserve counties. Second: That the penalty of $25 for each offense and a fine of $2 for each tree not properly lopped was omitted. There arose a difference of opinion as to whether or not it would be necessary, under the law, to lop the tops. This question was carefully investigated by the counsel

of this Commission who rendered an opinion to the effect that provision is made in the Revised Statutes when the law requires that a certain thing be done and no specific penalty is attached that the failure to do so constitutes a misdemeanor, and as such is punishable by fine or imprisonment. This information was distributed among the rangers and lumbermen within the regions affected by the law.

At the last session of the Legislature there was evidence of opposition on the part of some to the Top Lopping Law, and a few of the Adirondack owners have during the past few months failed to lop their tops.

In order to get competent information in regard to the efficiency and protection afforded by the so-called Top Lopping Law, three hearings were held by the writer at Watertown, Saranac Lake and Glens Falls during the early part of October. Subsequently field examinations were made by our forester in co-operation with some of the lumbermen. The data secured at these hearings and in the field work will be incorporated in a special report.

RECOMMENDATIONS.

The appropriation for forest fire protection should be not less than one hundred and twenty-five thousand dollars per annum. Approximately eight new observation stations should be established. Provision should be made for securing a quantity of tools at various points which will be determined by the district rangers. This will necessitate the purchase of a considerable supply of tools.

The value of a permanent force cannot be overestimated. The training which a man receives in the performance of his duties is of great value to the State. When men have been educated along the lines of the work, such as the proper preparation of necessary reports and accounts, becoming familiar with the location of the State's land, and acquainted with the people of the region which they have to cover, and knowing how to secure evidence to prepare a case, their services are of great value to the State. The men who prove themselves efficient and interested should be retained during the winter. Provision should also be made for the further training of men who are already on the force,

and this work can probably best be done by meeting the men in groups, or at one place, and giving them a few days' systematic lecturing and demonstration in regard to the performance of their duties.

FOREST PRODUCTS.

In accordance with the provisions of the statute, I hand you herewith a report as to the quantity of lumber manufactured and wood used for commercial purposes from timber grown in the State. These figures are for the calendar year 1911, as it is impossible on account of the large amount of work required, and furthermore, for the reason that several mills cut to the end of the year, to secure these statistics in time for our annual report of the current year.

Attention has often been drawn to the rapid removal of the merchantable material from our forest areas. The people are beginning to appreciate that these statements are only too true, and as a result there is a decided tendency to regulate cutting, work for reproduction of the forest crops and handle lands under a proper system of management.

Forest Product for 1911.

SPECIES.	Lumber, Ft., B. M.	Pulpwood, cords.	Number of mills reporting.
Spruce	81,841,173	403,983	408
Hemlock	132,941,586	71,392	1,685
Pine	79,189,015	466	1,203
Maple	66,396,012	.....	1,330
Birch	29,005,135	.....	663
Beech	42,128,494	.....	938
Basswood	29,637,603	2,960	1,324
Oak	28,947,157	.....	1,018
Chestnut	17,506,409	.....	655
Elm	14,239,789	.....	895
Ash	11,161,001	.....	1,067
Poplar	1,751,461	30,050	248
Hickory	1,301,312	.....	282
Cherry	3,581,193	.....	487
Cedar	378,960	.....	6
Butternut	95,960	.....	17
Cucumber	84,130	.....	7
Tamarack	64,875	.....	7
Sycamore	15,883	.....	5
Apple	25,000	.....	1
Locust	36,668	.....	4
Willow	18,800	.....	2
Black Walnut	7,070	.....	7
Ironwood	3,060	.....	3
Gum	259	.....	1
Balsam	*	43,378	22
Total	540,358,005	552,229	.....

* No separate report for balsam. It is included in total for spruce.

Miscellaneous Materials.

Round wood for alcohol, excelsior, cooperage, kilns, etc	235,091	cords
Shingles	30,301,275	pieces
Lath	41,685,150	pieces
Heading	20,785,484	pieces
Staves	54,801,951	pieces
Railroad ties	1,335,831	pieces
Posts	393,574	pieces
Poles	49,936	pieces

PRACTICAL FORESTRY.

There has during the year been a marked advance in regard to the application and practice of forestry in this State. Not only has the work of reforesting been greatly extended, and the sale of trees decidedly increased, but large acreages of private holdings have been examined with a view to better management, and State institutions are already practising forestry on large areas of their forest lands. The various matters will be discussed further in this report under proper headings.

REFORESTING.

This branch of our work has increased very rapidly during the past few years. It requires the undivided attention of one forester. The operations consist of nursery work, reforesting the Forest Preserve, planting lands of various State institutions and sale of trees to private parties.

Nurseries.

During the past year, two new nurseries have been established, one of five acres on the lands of the Great Meadows Prison at Comstock. Work was commenced at this nursery last winter, and convict labor has been used entirely, except for the services of an experienced foreman. The winter work consisted in building six hundred seed bed boxes, which enabled us to increase the annual capacity of the nurseries from approximately six million to twelve million trees per year. This nursery will be extended

Photo by George M. Pressey.

Scotch Pine Plantation, Three Years Old.
Property M. V. B. Ives, Potsdam, N. Y.

Photo by F. A. Gaylord.

SCOTCH PINE PLANTATION, THIRTEEN YEARS OLD.
CORNELL TRACT.

the coming spring and will cover ten or twelve acres. This is, we believe, the first attempt to employ convict labor for this purpose, and we hope that we will be able to make the anticipated saving in cost of production. There are a large number of men confined at this place, and it is desirable from the State's standpoint to keep them employed. Inasmuch as there are no nurseries growing these trees in quantity in this State, there is no interference with established industries.

A nursery of five and one-quarter acres was established during the fall, two miles east of Lake Clear Junction. The land has been leased for a period of five years. It is located near our nurseries at Saranac Inn and is in the heart of a large area of State land which must be planted. The soil is suitable and the nursery is conveniently located.

The two nurseries at Saranac will be placed under cover crops the next one or two years in order to increase the soil fertility. It has been demonstrated that it is necessary to operate our nurseries on a rotation system. Nearly all of the trees were moved from the large transplant nursery at Lake Clear Junction. This land was under a lease which expired last spring, therefore it was thought advisable to change the location and establish a new nursery on better soil.

The seed bed nursery near Lake Clear Junction and the Salamanca nursery have been operated as heretofore, and the Saratoga nursery was increased in size.

The seven State nurseries now comprise about forty-nine acres of land and contain approximately nineteen million trees of various ages.

A small experimental transplant nursery was made last year in the vicinity of Mountain Pond. There is at this place an extended plantation, and it was hoped that the watchman at this plantation could care for a quantity of transplants. Seventy-five thousand seedlings were set out in transplant rows in order to determine the feasibility of the work, thus enabling us not only to utilize to the fullest extent the services of the watchman, but reduce the cost of transportation from the nursery to the plantation. If satisfactory soil and other conditions are obtainable, this would doubtless prove to be an advantageous plan.

Last spring two hundred thousand red oak seedlings were purchased by the State Department of Highways, and we co-operated with that Department and assisted them in the planting. The trees were transplanted on the ground of the Training School for Boys at Yorktown Heights. This phase of tree-growing should be instituted in order that the State may have a satisfactory supply of material, and there is no reason why the required stock cannot be grown on the lands of State institutions, and in most instances inmate labor can be supplied.

There is in southeastern New York a great demand for planting material and a nursery should be located in that portion of the State. A suitable site has been found at the Matteawan State Hospital, and as soon as sufficient appropriations are available this work should be commenced.

Forest Preserve.

During the year over one and one-half million trees were planted on State land in the Forest Preserve. A larger number would have been planted if sufficient labor had been available. The work was done not only during the spring planting season, but a large number of trees were set out this fall. Experiments, which have been in progress for several years, indicate the feasibility of fall planting. The plantations made this year were as follows:

	Trees.
Near Benson Mines	162,000
East of Schroon lake	389,000
At Fowler's crossing near Saranac Lake	120,000
Fish hatchery land near Saranac Inn	110,000
Mountain pond	234,000
The fall planting was as follows:	
Near Oliver pond (town of Schroon)	40,000
Mountain pond	290,000
Miscellaneous	1,500

We have endeavored during the year to make plantations along lines of travel, in order that they may be accessible for inspection and the work be brought to the attention of the public. The

accompanying table is a statement of the Forest Preserve land which has been reforested. It will be noted that out of the 3,334 acres which have been planted, 1,353 acres were set out this year:

Forest Preserve Land Planted with State Stock.

WATERSHED.	ACRES.												
	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	Total
Lake Champlain	.....	500	.....	.....	55	265	11	435	25	36	25	396	1,748
St. Lawrence	.....	.....	.....	50	420	60	.....	25	6	.....	.....	570	1,131
Hudson:													
Upper	.....	.....	12	.....	.....	.....	.....	.....	.....	.....	.....	357	369
Mohawk	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lower	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
Delaware	.....	.....	.....	.....	.....	.....	.....	.....	50	.....	.....	30	80
	6	500	12	50	475	325	11	460	81	36	25	1,353	3,334

State Institutions.

Several of the various State institutions have appreciated the importance of reforesting and have been conducting this work for several years. The new Conservation Law permitted this Commission to supply trees to State institutions for their use free of charge. This has tended to increase the demand. During the past year about five hundred thousand trees were distributed and used for reforesting these lands. It is estimated that the institutions will require about one-half million trees per year. The past planting has been highly successful, and the managers are much interested inasmuch as a very satisfactory start has been made.

Private Lands.

The demand for stock to be used by land owners in reforesting their lands continued to increase. Nearly all of the former planters placed additional orders. There were over one hundred more orders this year than last. This is ample proof of the success of the former plantations and inasmuch as orders are steadily increasing the outlook is very encouraging. The accompanying table indicates the progress which has been made in reforesting during the past years:

Reforesting Statistics 1909–1912.

YEAR.	Number of nurseries.	Area of nurseries.	Capacity of nurseries	Trees sold private owners.	Trees planted on State lands.	Number of orders.
1909.....	5	25 acres....	8,227,000	1,005,000	90,000	189
1910.....	5	30 acres....	11,763,000	1,700,000	None	313
1911.....	6	37 acres....	15,769,500	1,670,370	120,000	410
1912.....	8	49 acres....	19,468,000	*3,587,875	1,346,500	524

* Includes 176,565 cuttings.

STATE INSTITUTION FORESTRY.

The new Conservation Law required this Commission to make an examination of lands of the State used in connection with State institutions, to make recommendations thereupon, and give advice in regard to the protection and improvement of the forests and shade trees on such properties. In accordance with this provision of the law, examinations of nearly all of the forest properties of the State institutions have been made and reports transmitted to the various officers in charge.

There are forty State institutions with a total land area of about thirty-five thousand acres under the direction of various State officials. These lands are situated in a large number of counties and on account of the varying character of the growth, past use, and the needs of the institution present numerous problems. As a matter of fact, these woodlands which belong to the State have not been handled any better than those under private ownership.

As an example of what can be done at these places, I cite the conditions at Craig Colony, Sonyea, N. Y. There are at this place one thousand forty-five acres of woodland consisting of young growth so dense as to require heavy thinning in order to get the maximum growth. The material secured from the thinnings will yield a profit and will also reduce the operating expenses of the institution, provide healthful work for the inmates and result in greater wood growth.

At Central Islip State Hospital there is a large area of typical Long Island scrub oak and pitch pine growth. This land is practically waste today, yet it can be reforested, made productive and greatly increase the appearance of the institution.

At Dannemora prison there is a large amount of forest land, some of which was burned over by the fires of 1908 and a large amount of timber killed. Plans have been made for the removal of the fire killed timber, which will yield the State a net revenue of approximately twenty-five thousand dollars and greatly improve the forest conditions, as will the reforesting of a large area which was accomplished this spring. Various cases of trespass upon the lands were discovered. The Superintendent of Prisons has employed a forester to carry out our recommendations. Other examples could be given.

As a general proposition, the work on the State institutions' woodlands falls under three heads:

1st. Cutting to improve the stand, or clean up former wastes and slashes and provide the necessary wood crop.

2nd. Reforesting either existing woodlands to improve the conditions, or bare unproductive areas, as a source of supply for some special industry.

3rd. Protection against fire, disease, insects and other attacks.

Forestry experiments are also being conducted at these places and a study is being made of the possibility of forestry as a factor in the employment and training of inmates where there is an opportunity.

TREE DISEASES.

The position of Forest Pathologist was created by the new law already referred to and several investigations have been conducted in relation to important fungus diseases which are of economic importance in this State.

White Pine Blister Rust.

The imported white pine blister rust has required attention in that all of the plantations made with this stock in the State have been inspected in order to make certain that the disease is not becoming established. The Forest Pathologist has also cooperated with the Department of Agriculture and rendered them assistance in connection with the control of the alternate stage of this rust which lives on leaves of the currants and gooseberries. The importance of the white pine as a tree requires that sufficient

steps be taken to not only prevent the establishment of the white pine blister rust, but also to control the rust which grows on the currants, because it is possible to spread the disease through the latter agency.

Chestnut Bark Disease.

As a result of the experiments and study into the nature and life history of the chestnut bark disease, made by this department, the following important points have been determined:

1st. That the fungus is disseminated from one tree to another almost entirely by wind.

2nd. That infection is possible through any sort of wound which exposes the inner bark.

3rd. That the spores which transmit the disease mature at all times of the year in great numbers, and the spore bodies are most liable to be broken during rain storms occurring in spring, summer and fall.

Arrangements are under way to secure financial assistance from and to co-operate with the U. S. Department of Agriculture in getting a survey of the chestnut area of this State.

Chestnut Oak Disease.

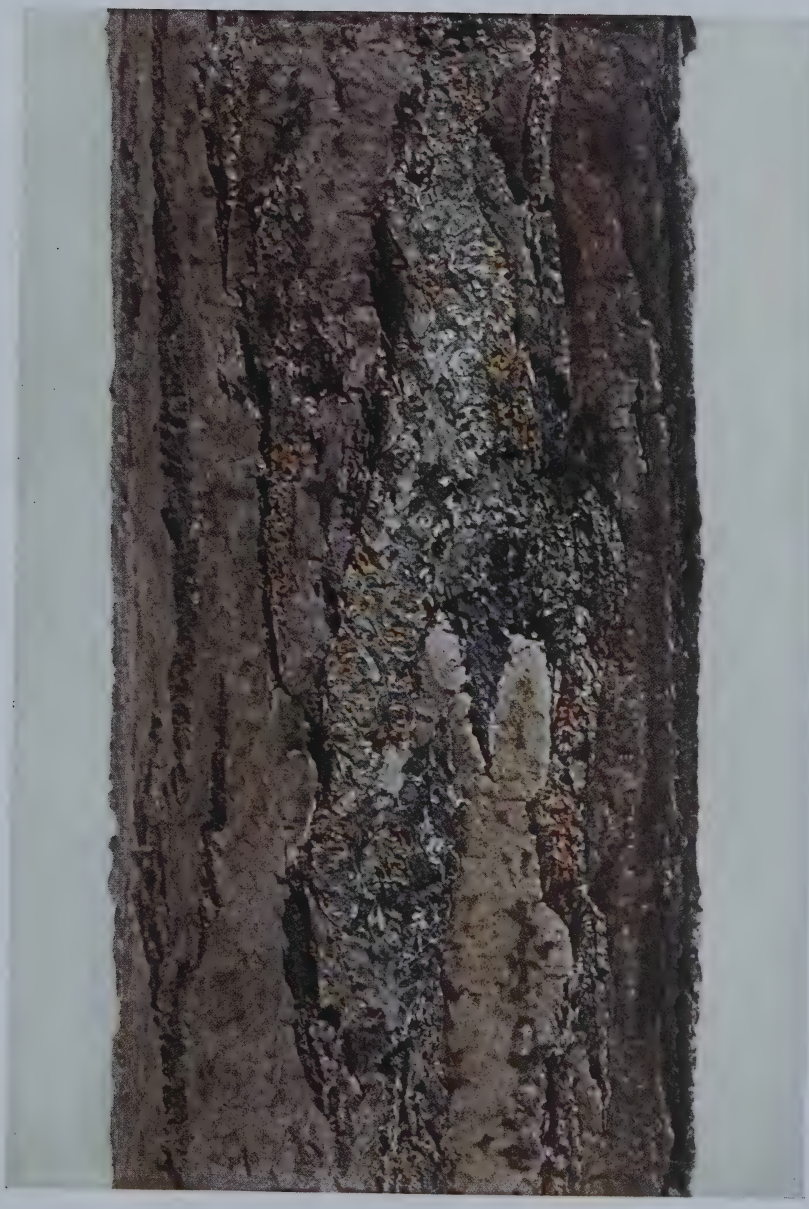
A disease of the chestnut oak was reported from Yonkers: an examination has been made and work is being conducted to determine its life history.

Nursery Diseases.

During the past summer it has been necessary to call the Forest Pathologist's attention to Norway spruce transplants in one of our nurseries which had an unhealthy appearance. He has not yet been able to determine whether or not a root disease, which is common in nursery soil, was the cause of this injury. The loss is probably due to a large extent to drought conditions and lack of soil nutriment.

In another case a native disease which occurs on pitch pine was found attacking Scotch pine, and an investigation of this matter is now being conducted.

Canker on Young Chestnut Trunk showing Yellowish Colored Pustles just oozing out through Bark (natural size)



Dead Chestnut Bark with Reddish Brown Pustles which produce Winter Spores (natural size)

Characteristic Fruiting Bodies in a Bark Fissure

Pustles which produce Summer Spores (enlarged five times)

Advice.

About two hundred letters have been received in the last few months making inquiries concerning tree diseases. Special trips have been made to various parts of the State in order to get information and co-operate with forest owners.

CO-OPERATION WITH PRIVATE OWNERS.

During the past summer a large number of examinations have been made of privately owned forest lands and advice has been given in regard to their management. In all cases the parties interested have paid the expenses of the forester, and on the other hand, we have secured useful information of public importance in regard to forestry matters in various portions of the State.

The International Paper Company was interested, and a valuation survey and map were made of over twenty-seven thousand acres of their land in the Adirondacks.

A similar map of a smaller tract of land owned by the Union Bag & Paper Company was also made.

The public is rapidly coming to realize the importance of the better utilization of wood crops, and the proper management of forest lands by the owner. The work which has been done in this connection will serve as object lessons in various localities, and when the owners appreciate the possibilities of these methods they will doubtless adopt them.

The large number of matters in connection with the management of forest properties and giving advice has nearly employed one forester. The pursuance of this work will tend greatly to increase the area under proper forest management.

GROWTH STUDIES.

Considerable work has been done the past summer in the field and in making analysis of spruce and pine trees in order to get definite information in regard to the rate of growth. These data will be compiled and the information will be available in the near future.

FOREST TAXATION.

At its last session the Legislature passed three laws relative to the taxation of forest lands. Two of them are amendments to the Tax Law, and one is a portion of the Conservation Law.

Full information in regard to this matter has been compiled and printed as Bulletin No. 8, entitled "Forest Taxation."

There is need of an investigation to determine the value of forest growth, the comparative assessed valuation in different towns, and the value of the land, in order to get sufficient data to work out a proper and equitable method of forest taxation. The old idea that the forests are a part of the real estate and that the growth should be assessed and taxed every year is erroneous. There is no good reason why a wood crop should not be given the same consideration in regard to taxation as is accorded agricultural crops.

INVESTIGATION.

The position of Director of Forest Investigations was created by the last Legislature, and various lines of work have been conducted thereunder.

STATE FOREST PROBLEMS.

Much interesting information has been compiled during the year relative to the State forest resources. The following facts have been obtained: Our forest area, or rather lands best suited for forest purposes, aggregate about twelve million acres, approximately 35 per cent. of the total area of the State. The value of the annual lumber cut and its direct remanufacture is over eighty-eight million dollars, and the industry employs thirty-eight thousand people, paying eighteen million dollars a year in wages. Other industries in which wood is largely used produce a product valued at three hundred million dollars, employ one hundred sixty thousand people, and pay one hundred million dollars a year in wages.

These figures are based on the best information available and are of course not absolutely correct, but many and the most reliable sources have been carefully considered in making this tabulation.

Only about one-quarter of the wood consumed is grown within the State, and if the twelve million acres of forest land were all devoted to forest production, and under proper management, we would, however, be able not only to supply our present needs, but doubtless have a surplus for export, or for use in new manufactures and industries. An analysis of the forest area shows that not over six million acres (50 per cent.) consists of com-

mercial forests. At least four million acres (33 per cent.) is not sufficiently stocked with commercial species, and the remainder, about two and one-half million acres (17 per cent.), without any valuable growth. This condition is due to forest fires, neglect, poor management, and the lack of appreciation as to the forest situation.

If this enormous area were placed under proper forest management it is possible that the wealth of the State could be increased not less than twenty-five million dollars a year. This increase could be brought about entirely by producing larger and better wood crops.

FOREST MAPS.

The first attempt to make a map showing the location and extent of the forest areas in the State occurred this year. It was discovered that the outlines of all the forested areas had been sketched by the U. S. Geological Survey field parties, but that in only a few instances had these data been published. Arrangements have since been made, at practically no cost, to secure the benefits of this past work. In addition various sources of information have been consulted, and, as a result, a preliminary map, showing forest conditions, has been made.

WOOD USING INDUSTRIES.

Plans were made early the past year to make a study of the wood using industries of this State in co-operation with the U. S. Forest Service. Unfortunately it was impossible to put our plans into effect, but the work was undertaken by another State agency, and the results are now being compiled.

Other independent studies are being made concerning forest industries and the possibility of developing markets for certain materials which now go to waste, or better markets than are now obtained for other woods.

EXTENSION.

This division is called upon from time to time to supply information in regard to various lines of forestry work. The amount of such mail is rapidly increasing and embraces a great diversity of subjects.

Work of this nature during the year consists of issuing various publications, exhibits at agricultural fairs, demonstrations in connection with the handling of forest lands, and a large number of lectures.

Exhibits.

It is time that a permanent exhibit for use at various fairs and other places be prepared. Each year we are called upon to do this work and usually it is very difficult to make a creditable showing on account of the limited funds available. There is no question about the necessity or value of educational work, and in order to put in effect conservation or the practical use of our forest resources it is necessary that a large amount of this work be done.

An exhibit was made at the State fair and at about fifteen county fairs, and nearly all of these places had a quantity of trees showing sample plantations, method of reforesting, and an attendant was present to give required information.

Moving pictures illustrating phases of our work which would prove both entertaining and instructive to the public could be made, and it seems desirable that some steps be taken by this commission to interest commercial companies engaged in this enterprise in order that they may carry out this suggestion.

Lectures.

Nearly all of the foresters have been called upon from time to time to give lectures before clubs, farmers' institutes, granges, and various other places.

Demonstration.

The woodlots and forest areas of the State institutions are proving advantageous as places for exhibit, and calling the attention of people in their vicinity to the method in which forests should be handled. Various plantations which have been made by private land owners are attracting the attention of others, and as a result a large number of our orders for trees are being received from parties who have seen the rapid growth which these small trees have made.

Last September a circular letter was sent to such people as might be interested in our reforesting work, and they were advised that a forester would be at our nurseries in the Adirondacks and would spend two days showing them all of our reforesting operations. A large number of people took advantage of this chance to see the work.

STATE WIDE FIRE LAW.

The recommendation was made last year that a suitable fire law be enacted to give proper protection to the extensive and valuable forests outside of the present "Forest Preserve." A similar law is in effect in the other Northeastern States and as our forests are equally important this law should be enacted and be so flexible that efficient protection will be secured in those towns where the forest interests are of sufficient importance. We are expending effort to get people to reforest and adopt better forest management but the results of this work all depend upon reasonable fire protection, and without it nothing definite will be accomplished.

The need is readily observed when one travels over the various parts of the State.

CONFERENCE OF STATE DEPARTMENTS.

The fact that there were several different commissions and State institutions engaged in forestry and kindred problems, all of which were working independently, made it seem desirable to call a conference of those interested.

A meeting was held in the office of this commission April 10, 1912, and was attended by representatives from the State College of Forestry at Syracuse, State College of Agriculture at Cornell University, Ithaca, State Education Department, State Agricultural Department, State Agricultural School at Alfred University, U. S. Forest Service, and by the State Entomologist, State Botanist, the Director of the Agricultural Experiment Station at Geneva, N. Y., and this commission. As a result a permanent organization was effected, an outline of work which should be conducted was prepared, and committees on forest investigation, forest mapping, standards, forest extension, tree dis-

eases and forest insects, were appointed, and plans to carry out the recommendations of that meeting are in progress.

MORTGAGE LANDS.

There are in the various counties of the State large areas of land, title to which has been acquired by the State through the foreclosure of loan commission mortgages. Portions of these lands are now lying idle and could be profitably used for forest purposes. They are at the present time by the provision of the statute, under the jurisdiction of the State Comptroller. It would seem wise that the management, care, and entire jurisdiction of these lands be transferred to this commission, and that they be used and developed for the best interests of the State. They could also be much better protected because this commission maintains a force of foresters and game protectors who could look after this work in connection with other duties.

Respectfully yours,

C. R. PETTIS,

Superintendent of State Forests.

Albany, N. Y., December 11, 1912.

APPENDIX TO ANNUAL REPORT

OF

DIVISION OF LANDS AND FORESTS.

SPECIAL REPORT OF THE CONSERVATION COMMISSION

ON THE

EFFICIENCY OF THE TOP-LOPPING LAW.

LETTER OF TRANSMITTAL.

ALBANY, N. Y., *March* 12, 1913.

Hon. ALFRED E. SMITH, *Speaker of the Assembly:*

DEAR SIR.— Herewith I transmit to you for the information of the Assembly, a special report on the efficiency of the top-lopping law embodying the results of an investigation conducted by the superintendent of forests.

Respectfully yours,

GEORGE E. VAN KENNEN,
JAMES W. FLEMING,
JOHN D. MOORE,
Conservation Commission.

BY GEO. E. VAN KENNEN, *Chairman.*

MAP
OF THE STATE OF

NEW YORK

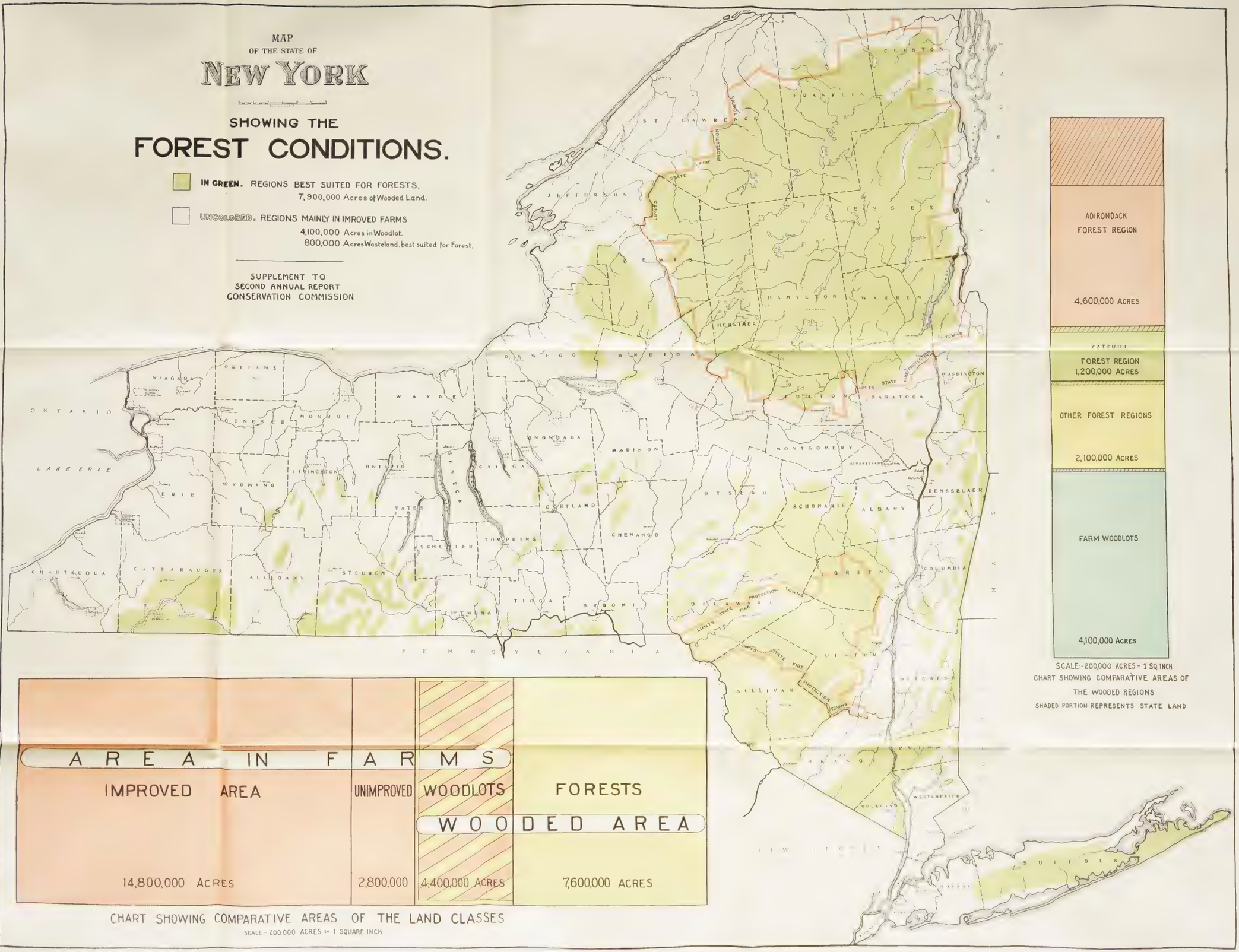
SHOWING THE

FOREST CONDITIONS.

IN GREEN. REGIONS BEST SUITED FOR FORESTS.
7,900,000 Acres of Wooded Land.

UNCOLORED. REGIONS MAINLY IN IMROVED FARMS
4,100,000 Acres in Woodlot.
800,000 Acres Wasteland, best suited for Forest.

SUPPLEMENT TO
SECOND ANNUAL REPORT
CONSERVATION COMMISSION



ADIRONDACK
FOREST REGION
4,600,000 Acres

CATSKILL
FOREST REGION
1,200,000 Acres

OTHER FOREST REGIONS
2,100,000 Acres

FARM WOODLOTS
4,100,000 Acres

SCALE--200,000 ACRES = 1 SQ INCH
CHART SHOWING COMPARATIVE AREAS OF
THE WOODED REGIONS
SHADED PORTION REPRESENTS STATE LAND

AREA IN FARMS		WOODED AREA	
IMPROVED AREA	UNIMPROVED	WOODLOTS	FORESTS
14,800,000 Acres	2,800,000	4,400,000 Acres	7,600,000 Acres

CHART SHOWING COMPARATIVE AREAS OF THE LAND CLASSES
SCALE - 200,000 ACRES to 1 SQUARE INCH

SPECIAL REPORT

ON THE

EFFICIENCY OF THE TOP-LOPPING LAW.

March 10, 1913.

Conservation Commission, Albany, N. Y.:

GENTLEMEN.— I submit herewith the results of an investigation into the value of the so-called "top-lopping" law as a means of reducing the forest fire danger.

This provision of the fire law was drafted by a committee appointed at a conference, called after the disastrous fires of 1908, to secure a more effective law. It was suggested by the lumbermen and but little objection was made in regard to its enforcement until last year. When the new forest law was passed at the last session of the Legislature, its application was limited to the so-called "fire towns," and the provision providing a penalty for failure to lop tops was stricken out.

At that time there seemed to be a question as to the effectiveness of this method as a means of reducing the forest fire danger. On account of the heavy snow cover, field examination was impossible then, but in order to secure definite facts for your consideration, last fall, before the winter began, I investigated this matter and report as follows:

During the week of September 30th, three hearings were held at Watertown, Saranac Lake and Glens Falls by the Superintendent of Forests to determine what the feeling was in regard to the top-lopping law in its present standing.

The results were quite unsatisfactory because of the difference of opinion expressed. The objections to the law were:

1. That the soil burned much deeper in the case of a fire running through lopped tops as against unlopped tops where the fire occurred one to three years after the cutting.

2. That fires could be fought easier in unlopped tops than lopped tops.

3. That a fire would burn faster in lopped tops than in unlopped tops, and therefore burn over a greater area in the same length of time.

4. That unlopped tops decay and consequently disappear sooner than lopped ones.

5. That unlopped tops cast more shade on the ground.

6. That lopped tops do not cause moister soil conditions.

7. That lopped tops seriously interfere with the reproduction on a cut-over area.

8. That the operator should be reimbursed for his increased outlay if tops are to be lopped.

9. The cost of lopping is too great.

10. That the law was unconstitutional, inasmuch as it caused a private individual to spend money for something that accomplished no public benefit.

11. That the tops could be lopped to a given diameter limit, say three inches, and produce the same result at a decreased cost.

The opinions brought out were so conflicting and the idea was so emphasized that the law had not been in effect long enough to reach a final conclusion, and that more complete information should be secured by field excursions, that Forester Gaylord, together with various fire rangers, lumbermen and others, spent nearly ten days examining carefully into the various conditions of lopped and unlopped tops and the fire danger.

The tracts visited were as follows: The Taggart Paper Company's, the Brandreth Preserve, Ne-ha-sa-ne Park, the Whitney Preserve, the lands of P. X. Blake near Joe Indian pond, and the Santa Clara Lumber Company's holdings. Nearly all conditions and ages of lopped and unlopped tops were also inspected.

The points raised will be discussed in the order above stated.

Objection 1. *That the soil burned much deeper in the case of a fire running through lopped tops as against unlopped tops where the fire occurred one to three years after the cutting.* In the case of the fire at Sperry pond on the Whitney tract, it was shown most decidedly that fires which occur in the early spring

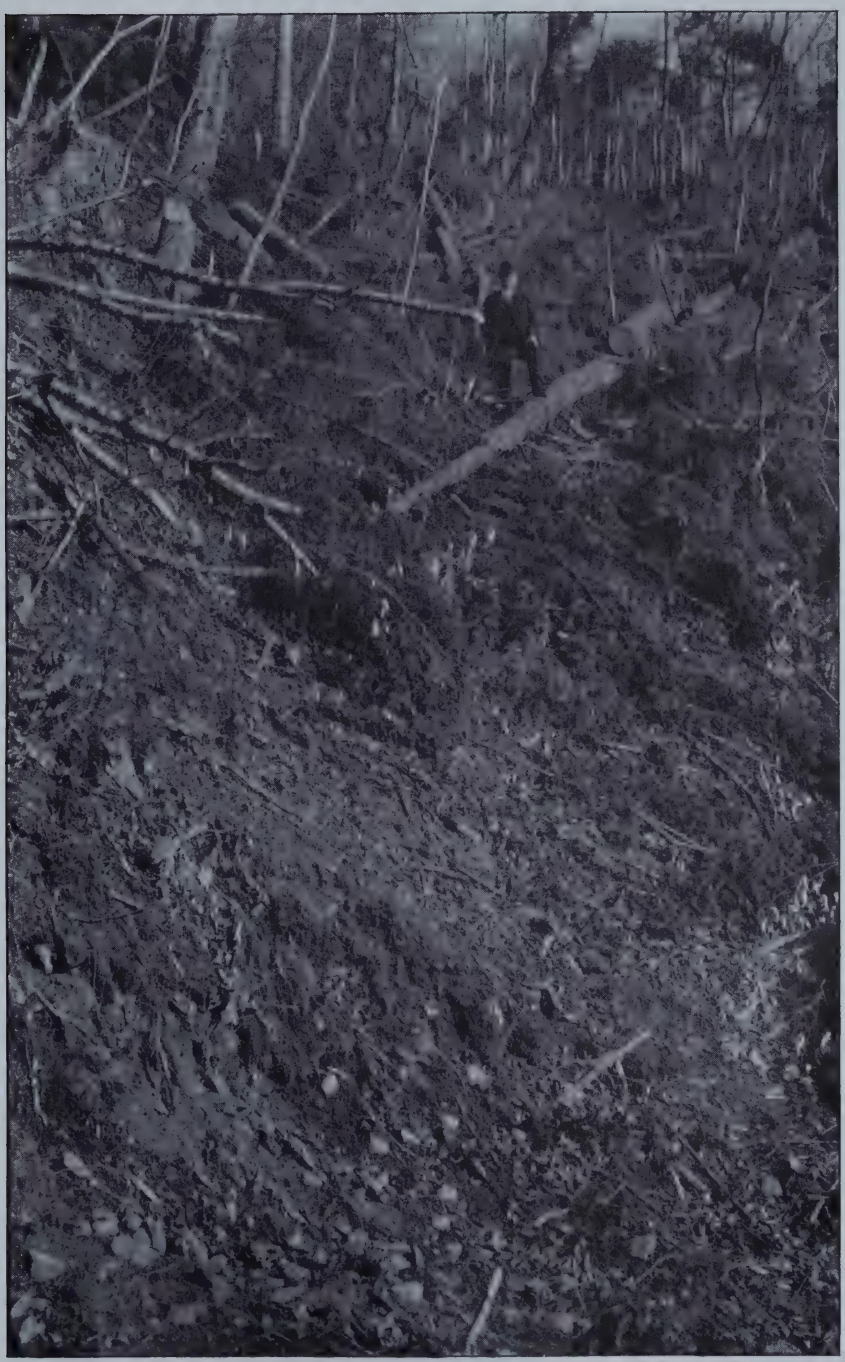


Photo by J. W. Stephen.

Top Properly Lopped.

After Lumbering in Heavy Stand of Spruce.

Photo by F. A. Gaylord.

do no more damage in lopped than in unlopped tops, and in this case the fire occurred only a year after the cutting. Piles of lopped branches were found which were only partially burned and there would be a great mass of the fine twigs and leaves left wholly untouched at the bottom of these piles, showing that at this time of the year these piles are in a very damp condition and even when the surface is sufficiently dry to burn, there will be enough moisture, either as water, snow or ice, to prevent a complete burning of the piles and keep the fire from burning into the soil at all. In the case of the fire at Sperry pond, it was found that the unlopped tops were very badly charred and burned to nearly the same extent as the lopped branches which were on the ground.

Objection 2. *That fires could be fought easier in unlopped tops than lopped tops.* The only evidence secured of actual experience was that fire lines could be made quicker in lopped top areas and, therefore, fires could be fought easier.

Objection 3. *That a fire would burn faster in lopped tops than in unlopped tops, and therefore burn over a greater area in the same length of time.* It seems to be the opinion among those who have fought fires under these two conditions, that, if there is any difference, the fire burns slower in the lopped tops, as here the material lies close to the ground and in a much moister condition and there are not the chances of helping the fire along by the draft which is always created by a forest fire. The blaze is much lower and is less likely to cause a crown fire.

Objection 4. *That unlopped tops decay and consequently disappear sooner than lopped ones.* The opinion of practically every one, except a very few, was that lopped tops will decay and disappear sooner than unlopped tops. Decay is induced by fungous growth which demands both air and moisture to carry on this work in the most rapid way. The combination of air and moisture is best at the surface of the ground; this act being well brought out by the decay of posts and poles which have remained in the ground for some little time. These always show the greatest amount of rot where they enter the ground. In the case of old buildings, the part which shows the greatest signs of decay is always that closest to the ground. In the case of old lumbering

operations where large tops were left unlopped, the branches on the under side of the top have rotted away as they came in contact with the soil until the main stem of the top has become flat upon the ground, but even now all the branches on the upper side of this stem are still in an excellent condition for burning.

The thoroughness with which the top-lopping has been done has to a large extent affected the rapidity of decay. On operations where care has been taken to get this brush on the ground, the latter condition has been the better.

As near as could be determined from our inspections, we reached the conclusion that the average top as now lopped would decay and have practically disappeared as a fire danger in approximately seven years, while it would take the same top fifteen years to decay and disappear if unlopped.

The rate of decay will depend upon local conditions. It will be greater where the underbrush is dense and on the north and east slopes. It will be slower where there is less shade and more sun and also when the tops are rich in pitch.

Objection 5. *That unlopped tops cast more shade on the ground.* It is self-evident that where tops are lopped the effect of the whole of every branch is felt in casting shade, while in the case of an unlopped top there are at least half of the branches which cast a very much foreshortened shadow, due to the fact that they are upright instead of lying flat on the ground. Therefore, the aggregate amount of shade from an unlopped top could not possibly be as great as that from the same branches lopped and lying on the ground.

Objection 6. *That lopped tops do not cause moister soil conditions.* The moisture conditions are very much bettered by lopping because:

First.— As has just been brought out, they benefit through the casting of the maximum of shade.

Second.— The branches scattered around on the ground serve as a great hindrance to evaporation and also to air currents coming in contact with the soil, thereby greatly decreasing evaporation.

Third.— The extreme moisture conditions of the spring are retained for a much longer period, thus shortening the dry fire

Photo by F. A. Gaylord.

Effect of Fire on Lopped Branches.

Photo by F. A. Gaylord.

Reproduction Not Affected by Lopping.

season. Snow and ice will also last much longer under lopped tops.

Objection 7. That lopped tops seriously interfere with the reproduction on a cut-over area. It was ascertained that whether the tops are lopped or not, about ninety per cent. of the branches which are cut from the trees are cut from the saw logs or pulpwood, which leaves the forest as merchantable material, and these limbs are necessarily more or less piled and form the conditions which tend to prevent reproduction. The addition of ten per cent. or less of the material, which is a result of the lopping, cannot decrease the amount of reproduction more than ten per cent. In the case of Ne-ha-sa-ne park, where the tops were lopped, was noted one of the finest examples of spruce reproduction to be found in the Adirondacks.

Numerous examples were found which show that lopping does not kill all of the seedlings which have started, and furthermore, that not only are they able to grow up through the debris, but new ones are able to start.

Objection 8. That the operator should be reimbursed for his increased outlay if tops are to be lopped. The basic principle of this law is that lumbering increases fire danger and that the person who operates is responsible for the change. It has been necessary to enact laws in many lines that limit various business enterprises or direct how they are to be conducted. In none of these cases does the State itself pay for the increased burden imposed upon the parties affected. The land owner derives better fire protection and the laws operate in his favor in case an adjacent owner is lumbering, as well as against him when he himself cuts.

Objection 9. The cost of lopping is too great. The cost as given by lumbermen varies from fifteen to fifty cents per cord. The first figure is probably more nearly correct, as it has been the custom since the law went into effect to pay jobbers an additional five cents per market or fifteen cents per cord to lop tops and several jobbers have been heard to say that they could make a little money at this figure. The lopping of tops on the Webb Preserve about twelve years ago cost approximately eight cents and the job was perfectly done. The cost of lopping varies from ten to twenty-five cents per cord on different operations, but the average is probably not over fifteen cents.

The larger the average trees cut, the less it would cost per market to lop the tops. In lopping tops some lumbermen claim that they take material out which otherwise would be wasted; thus there is a slight reduction of costs from this source. When the tops are lopped it would be somewhat easier to clear the skid gutters and therefore cheaper than when unlopped.

The question of cost is of great importance. Industries can be forced out of business, or the operations be made unprofitable, by imposing too heavy or unnecessary restrictions. The purpose of the framers of this law, and the practical results, all depend upon the single idea of hastening the decay of the slash left in lumbering. This is accomplished by getting the tops and branches so near the ground that they will decay in the shortest possible time. After a careful study of this matter, we feel that if the limbs and branches were all cut off, or severed as far up the tree or out each limb to a point where the diameter of the main trunk or the limb was not more than three inches, the purposes would be accomplished and the cost would be reduced below what has been stated as the minimum price.

Objection 10. *That the law was unconstitutional inasmuch as it caused a private individual to spend money for something that accomplished no public benefit.* This question of course rests entirely on the fact of increased fire protection through the lopping of tops and the foregoing facts are presented for your consideration in this connection. A large number of prosecutions have been conducted and recovery secured, but this question has not been passed on by the courts.

Objection 11. *That the tops could be lopped to a given diameter limit, say three inches, and produce the same result at a decreased cost.* This is, for instance, lopping the branches from that part of the main trunk or limb over three inches in diameter, or in the case of cleaning out roads, no small trees under three inches on the stump would be lopped.

There is no doubt that if the law should be modified by such a diameter limit, the ultimate results would be the same as though the whole top were lopped. The larger branches from the lower part of the tree will oftentimes be of a diameter as large or larger than the small pieces of unlopped tops which would be left and

Photo by F. A. Gaylord.

PRESENT CONDITIONS WHERE TOPS WERE NOT PROPERLY LOPPED TEN YEARS AGO.

Photo by F. A. Gaylord.

Inflammable Tops Remaining Fourteen Years After Lumbering.

Photo by T. S. Dwight.

Unlopped Top Sixteen Years Old.

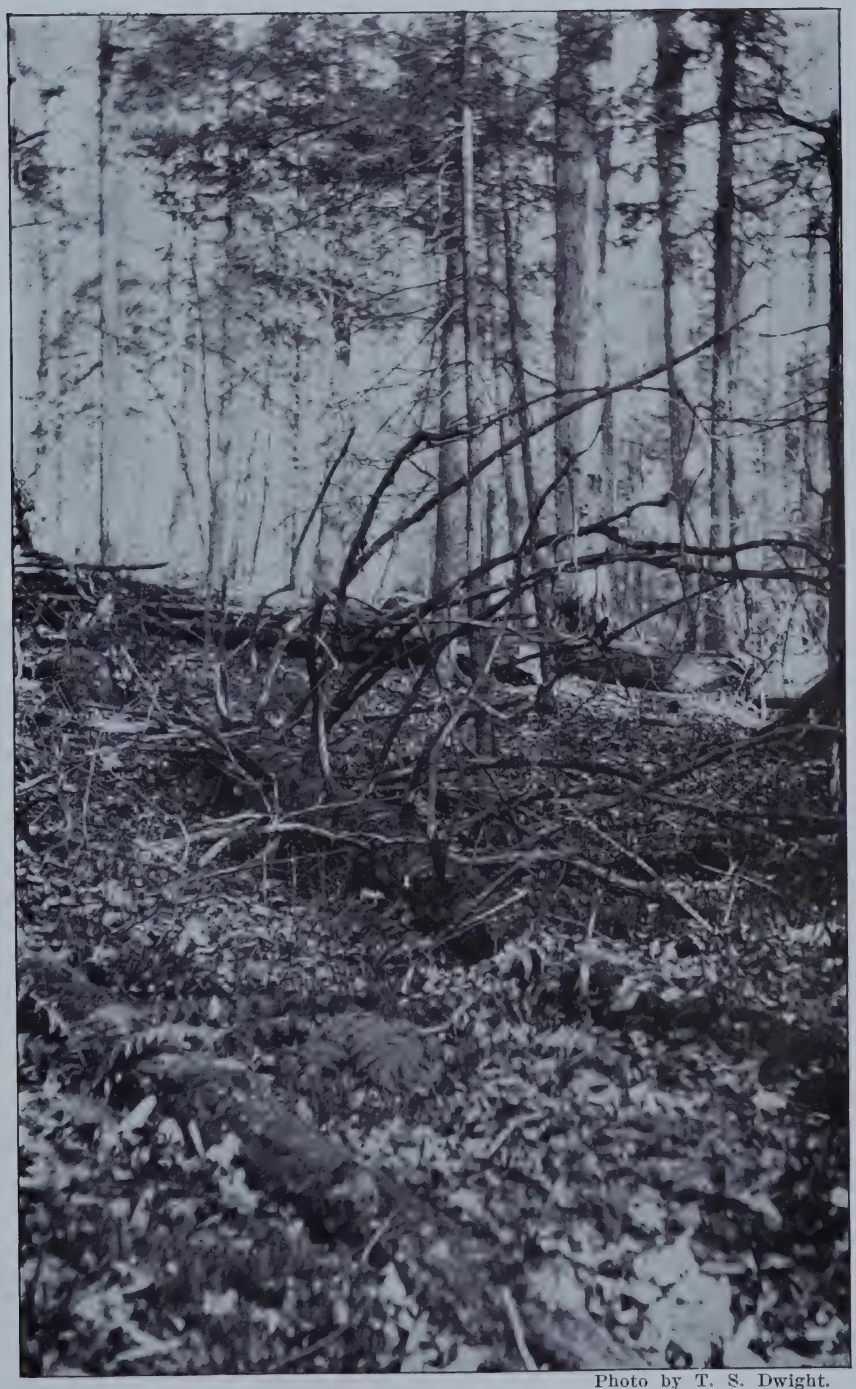


Photo by T. S. Dwight.

Unlopped Top Twenty-one Years Old.

should be lopped. They are largely made up of heartwood, which would decay much more slowly than the top of the tree, below three inches, which would be practically all sapwood. When the larger limbs had disappeared, the top would also have disappeared, while at the present time the small part of the top disappears much more quickly than the larger limbs, which have been lopped from the merchantable material.

It would be wise to give the Commission some discretion in the enforcement of the law. In cases of small detached woodlots, it might not in all cases be necessary to require lopping and in other cases it might be wise to permit some latitude as to time of lopping. If the law were modified on this point, we believe that the cause of a large part of the objection to the present law would be removed.

After giving this matter thorough investigation and careful consideration, we have reached the following conclusions:

First. That the top lopping law does very materially increase the fire protection, because the period of danger after lumbering is greatly shortened. It is admitted that if a fire does occur within two or three years after lumbering, the damage will be fully as great, and in some cases worse, when lopped, but this danger exists for a far shorter period.

Second. That the thoroughness with which the lopping is done, has much to do with the future results. If the operator appreciates that proper lopping induces decay and endeavors to get the brush as close to the ground as possible, excellent results will be obtained.

Third. That a limitation may be made beyond which it is not necessary to lop. We believe that if any tree, limb or top has its branches cut off from any part which is over three inches in diameter, the material will be sufficiently near to the ground to induce decay and that lopping below this size is an unnecessary waste of time and money.

Fourth. That on account of bark peeling operations which must be done within a limited time, this Commission should be given power to grant a reasonable extension of time in order that the operators may accomplish their work at the minimum expense. This will not increase the fire danger, because green tops are not inflammable.

Fifth. That section 90 of chapter 444 of the Laws of 1912 should be amended to read as follows:

§ 90. Limbs and branches to be *cut off* [lopped]. Every person who shall, within any of the towns enumerated in section ninety-seven of this chapter except as hereinafter provided, *fell* [cut] or cause to be [cut] *felled* or permit to be [cut] *felled* any evergreen trees for sale or other purposes shall cut off [or lop] or cause to be cut off [or lopped] from the said trees *and the limbs thereof, at the time of felling the said trees or at a time to be fixed by the commission as hereinafter provided,* all the limbs or branches thereof *up to a point where the trunk or branch has a longest diameter which does not exceed three inches,* unless the said tree be [cut] *felled* for sale and use with the branches thereon or for use with the branches thereon. *If the commission shall by resolution determine that no danger to neighboring or other forests will arise if the limbs or branches of trees growing on particular lands to be described in said resolution are not cut off at the time of felling the said trees, the limbs and branches thereof need not be cut off at that time but in that case the same shall be cut off as above required at the time fixed by the commission and such time shall be fixed in said resolution. If the commission shall by resolution determine that no danger to neighboring or other forests will arise if the limbs and branches of trees growing on particular lands to be described in said resolution are not cut off if said trees are felled, then this section shall not apply to the person who shall fell said trees or who shall cause them to be felled or permit them to be felled. Any person violating the provisions of this section shall be guilty of a misdemeanor and shall, upon conviction, be liable to a fine of not more than twenty-five dollars or to imprisonment for not more than thirty days or to both such fine and imprisonment for each offense and in addition shall be liable to a penalty of two dollars for each and every tree felled and from which he shall fail or neglect to cut off or cause to be cut off the limbs and branches as required by this section.*

Respectfully submitted,

C. R. PETTIS,

Superintendent of State Forests.

Photo by F. A. Gaylord.

VIEW ON LUMBERING OPERATION WHERE TOPS HAVE BEEN LOPPED TWO YEARS.

ANNUAL REPORT

OF

DIVISION OF FISH AND GAME.

[115]

CONSERVATION COMMISSION.

DIVISION OF FISH AND GAME.

To the Conservation Commission:

In transmitting the annual report of the Division of Fish and Game I desire to direct attention to the effective work of the Commission's protective force. During the present year the law increased the number of game protectors from 95 to 125. The number of violations prosecuted in 1911 was 1,485. The present year shows an increase of 210 cases prosecuted, with a decrease of $385 in the costs of recovery. It is worthy of comment that a large number of these cases were handled by the regular protectors without legal assistance, thereby saving a substantial sum in attorneys' fees.

The codification of the game law during the present year, in the interest of uniformity and simplification, and the elimination from existing statutes of a mass of special provisions which have heretofore added to the difficulties of enforcement, gave us a statute which is generally regarded by sportsmen as the best game law possessed by any State. A year's experience with the statute in its present form has, as might be expected, suggested a number of minor changes for the purpose of perfecting it, but the wisdom of the work of codification, and its results, have been fully justified.

The law providing for the importation and sale of foreign game, and the tagging of such species as may be legally sold, continues to meet with the success which followed the first year of its enactment. During the year 1912 the following imported game was tagged:

34,849..... Pheasants
20,387..... Scotch grouse
46,117..... European black game
66,357..... " " plover
45,214..... " red-legged partridge
36,879..... " quail

Making a total of 339,297 birds tagged by the importation agents of this division. In addition, 3,556 carcasses of imported deer were tagged at the port of New York.

I am pleased to call your attention to the increased output of pheasants and eggs from the State Game Bird Farm at Sherburne. In 1910 there were 1,478 birds and 6,470 eggs; in 1911, 2,232 birds and 11,325 eggs; in 1912, 3,409 birds and 12,681 eggs. This increase has been brought about entirely by efficient management and without additional appropriation. Interest in the propagation of pheasants under the direction of the Commission has taken a firm hold upon the sportsmen of the State, and nothing illustrates this better than the fact that during the year 1912 there were 28,261 pheasants and 126,361 eggs applied for. Our single game farm under the most favorable conditions cannot supply beyond 30,000 eggs and 5,000 birds. The widespread sentiment in favor of additional game farms is reflected in these applications. Reports from all parts of the State, had through the game protective force, show a substantial increase in the supply both of birds and quadrupeds, owing in a large degree to the enforcement of the laws relative thereto.

In the Bureau of Fish Culture the work of the nine hatcheries in operation has resulted in a larger output than in any previous year. The number of species of aquatic animals propagated and distributed was 39, including sturgeon, salmon of all kinds, trout of half dozen species, whitefish, lake herring, frostfish, shad, river herring, smelt, muskalonge, pike-perch, black bass, sea bass, scup, tom-cod, flatfish, lobsters and blue crab. The marine work is limited to Long Island, which has more than one-half of all the species of fish of the State and is particularly rich in those kinds which can be propagated artificially. In 1912 the Long Island station and its auxiliaries furnished more than 400,000,000 of fish for distribution. The peculiar advantages

of the island make it possible for this State to outrank all the States in marine fish culture. The total yield of fishes for planting was about 730,000,000, an increase of nearly 200,000,000 in two years.

The expenditure for the maintenance and the expenses of hatchery was $61,505.40, while the actual market value of the fish produced was $210,934.79, besides the brood stock at the stations, which is worth at least $10,000 more.

In the Bureau of Marine Fisheries the greatest need continues to be the enactment of a proper statute for the sanitary inspection of shellfish grounds and their products, and it is to be hoped that the day is not far distant when there will be placed upon our statute books a law which will fully protect the public health against the dangers arising from the cultivation of shellfish in waters polluted by sewage.

December 31, 1912.

THOMAS H. GUY,
Deputy Commissioner.

ANNUAL REPORT

OF THE

CHIEF GAME PROTECTOR.

ANNUAL REPORT

OF THE

CHIEF GAME PROTECTOR.

Hon. Thomas H. Guy, *Deputy Commissioner, Division of Fish and Game:*

Sir.— I respectfully submit herewith my report on the enforcement of the Conservation Law relating to fish and game of the State of New York, for the year ending September 30, 1912, covering the work performed by the protectors in the bringing of actions, together with the amount of recoveries of fines and penalties, and prison sentences, for violations of the Conservation Law. The statistical table which follows shows a substantial increase in the number of cases successfully prosecuted. The regular protectors prosecuted this last fiscal year more cases than during the preceding year, having a gain of 213 cases. The increase over the fiscal year of 1911 shows that the regular protectors have given strict attention to their duties, and their work as a whole is satisfactory.

This cannot be said of the special protectors, as there are a great many specials who do little or no work in the enforcement of the Conservation Law relating to fish and game, and some of the few who are active are a discredit to the work of the department. I think this is largely owing to the fact that the law does not require a special game protector to pass a Civil Service examination on questions pertaining to the conservation law in relation to fish and game. Therefore they have very little, if any, knowledge of the law, and when prosecuting a violator it is necessary for them to have the assistance of counsel. This entails upon the Department a large expense, which is not the case where a regular protector prosecutes violators; for the record will bear me out in the statement that a large percentage of cases are han-

dled by the regular protectors without legal assistance. In a great many instances where a violator has been successfully prosecuted by a special protector, a large part of the work has been done by a regular, for which the regular protector receives no credit, and half of the recovery is paid to the special as his moiety. Therefore I believe if it is deemed wise to continue the special protectors, that they should be required to pass a non-competitive Civil Service examination. In that way more competent men would be secured.

The average of gross recovery and costs in each case is very commendable, in view of the fact that all persons prosecuted were not fined. The majority were, but many received suspended sentences on pleas of guilty; others were acquitted from John Doe proceedings, and thirty-six persons were sent to jail for a collective period of 1,688 days.

On April 15, 1912, the Conservation Law was signed by the Governor, and in a majority of cases has proven very satisfactory. In the work of endeavoring to amend the bill so as to meet the approval of the Legislature, changes which should have been made were overlooked. The changes which in my opinion should now be made relate more to the form than to the substance of the law. The repeated changing of the law works no good, but can only create confusion and work dissension in the ranks of the sportsmen or others interested. It is as impossible to obtain a perfect fish and game law in the sense that it would please everybody, as it is to turn night into day. At a great expense the State has secured a nearly uniform law for the protection of fish and game, and with a very few changes it will be as simple and easy of construction as any which can be made. Having in mind that the present law is drawn on the permissive plan, you will readily see that any considerable number of changes made therein is apt to throw the whole law out of balance, and create conflicting and inconsistent provisions, making it impossible to recover for violations thereof. Each and every provision of this law was drawn advisedly, and each has its particular friends. Change any provision to suit any particular person or number of persons, and you have antagonized those who believe that the present provisions are satisfactory and sufficient.

Having those things in mind, I would, as I said before, only submit a few changes which relate to the form of the law, and one or two suggestions as to its substance; for example:

Section 177, subdivision 2, in the first line after the word "fish," strike out the words "protected by law." This change is rendered necessary because of the fact that fish protected by law only includes fish for which a close season or size limit is provided, and the law as it now stands might easily be construed to permit the taking in any manner of such fish as carp, suckers, eels, bullheads and catfish.

In section 178, subdivision 2, the portion of this section which compels fish in transportation to be accompanied by the owner thereof should be amended so as to permit fish the sale of which is not prohibited to be transported without being accompanied by the owner. The law at the present time prohibits the sale of all game, and of brook trout and black bass. In order to give effect to the provisions prohibiting the sale of such fish and game, it is necessary to have a stringent law regulating the transportation of the same; but of necessity that ought not to apply to fish the sale of which is not prohibited.

The opening of the season for the taking of squirrels should be October 1st, so as to correspond with the opening of the season for grouse, woodcock and cottontail rabbits. The present season on squirrels opening September 16th, gives the hunter an excuse to go into the woods at that time, and many who are careless in the use of a gun might be provoked into shooting other game out of season.

The correspondence shows that the consensus of opinion of the trappers of the State is that the muskrat season should open November 1st and close April 20th. The same applies to the mink and martin. At the present time the mink season opens November 1st; the muskrat season, November 10th. Trappers claim that in setting traps for mink November 1st, muskrats are liable to be taken; therefore the law on mink, muskrat and martin should be made uniform.

There are other minor changes that should be made; but as a whole the law has proven satisfactory, and as stated before, should be kept practically intact until it has had further trial.

The few recommendations that I have cited of changes in the conservation law relating to fish and game are given for the purpose of illustrating how easily the law can be amended so it will be as perfect as any law can be made.

NON-SALE OF NATIVE GAME.

The measure prohibiting the sale of native game is without a doubt one of the best laws ever enacted in the State of New York for the preservation of our native wild game. It not only preserves our native game, but closes to the pot hunters the greatest market in this country, namely, New York city, which in past years used at least one hundred thousand wild ducks and snipe alone. These birds had been shipped to New York markets from other states and sold therein during the close season for wild duck and snipe in New York under bond by the dealer. This bond permitted the dealer to sell game, provided a waybill was produced when an inspection of his premises was made, showing that the game came from without the State. Under this system it was easy for a dealer, after buying one shipment from without the State, to sell all the native game he wanted to, provided they were not in excess of the number of birds designated by his waybill. There was a good deal of sentiment against the law which permitted the sale of wild duck or snipe, which at some time or other during their migration were found in our State, where they could not be taken. The situation with reference to the sale of grouse or quail was somewhat similar to the conditions in regard to duck and snipe. This is all done away with by our present tagging system, which distinctly classifies the game that may be sold, placing it in such shape that it may be easily recognized, even after the head and feathers have been removed. The law provides that the tag must remain on the carcass until it is consumed, and the hotels and restaurants cook the birds with the tag attached.

The only objections to the tagging law have come from the people whose entire interest is killing game for market purposes; and while a great many people are beginning to realize the fact that game is a valuable asset to the people, there are always a few who will object to the law which curtails their selfish interests.

In Europe many of the land owners pay their taxes with the money derived from the leasing of the shooting privileges on their lands. When the American farmer begins to realize the economic value of game, it will be a great help to the sportsmen of the State.

TAGGING OF TROUT.

While the tagging of trout raised in private hatcheries has only been in actual operation a few months, it has proved successful as a check on the illegal traffic in wild trout, thereby aiding in the preservation of our native trout. The system of allowing the sale of hatchery raised trout during the entire year after the same has been tagged with a machine furnished by the department is giving general satisfaction to the hotel and restaurant keepers who deal in this commodity, as they feel perfectly safe in handling trout at any time, since the tag assures them of its legality. The tagging of trout also has a tendency to do away with violations, inasmuch as a dealer will not aid a fish pirate in disposing of his illegal goods, taking the chances of being fined for a violation of the law, when he can by a legal method satisfy his customers' wants. The tagging of trout is also proving a revenue for the State, as a charge is made of three cents per tag, the tags being furnished by the department to the hatchery, and the hatchery is operated under license issued by the Conservation Commission. During the short time that this law has been in operation, the department has received for tags and machines $1,479.64. At first this law was subject to some criticism from the owners of private hatcheries; but when they have come to realize that the sale of trout from a hatchery was allowed during any time of the year instead of as formerly during the open season for wild trout, they have become reconciled to the law. It is working a further benefit to the private hatcheries in the State of New York, as formerly there were about sixteen firms sending trout into the State. At the present time there are only eight machines in operation. As the hatcheries located out of the state are finding a market for their trout elsewhere, this works a benefit to the State hatcheries who are operating under the trout tagging law.

ADDITIONAL PROTECTORS.

The State of New York has over nine million inhabitants, which is nearly one-tenth the population of the United States; and has an area of 49,170 square miles, embracing two of the Great lakes, the St. Lawrence, the Hudson and the Delaware rivers; a large number of small lakes and rivers, as well as the Adirondack mountains; and there are only one hundred and twenty-five regular game protectors to enforce the Conservation Law in relation to fish and game, in this vast and thickly populated State. I therefore strongly recommend that seventy-five additional protectors be appointed, increasing the force from one hundred and twenty-five to two hundred men. The increase is necessary owing to the large number of violations of our law which are occurring. With the present force it is impossible to detect but a small percentage of them.

I respectfully call your attention to the following, which is the best argument that I can put forth in relation to the necessity of increasing the force of regular protectors; In 1911 there were ninety-five regular protectors, who successfully prosecuted during the month of October in that year, one hundred and fifty-one misdemeanors under the Game Law, recovering $3,127.05. During the session of the 1912 Legislature a bill was passed providing for thirty additional protectors, increasing the force to one hundred and twenty-five men. With this additional force, during the month of October in 1912 there were two hundred and fifty-seven successful prosecutions for misdemeanors of the Conservation Law in relation to fish and game, with recoveries of $4,742.55. This shows a gain of one hundred and six cases over October, 1911, and a gain of $1,615.50 in recoveries; which bears out the statement that it is impossible thoroughly to enforce the law with the present force of protectors. I firmly believe that if the seventy-five additional protectors are provided for, you will see a substantial gain in the number of successful prosecutions, and a large gain in the amount of recoveries for violations.

The statistics quoted are taken from the record of the month of October, as that is the beginning of the fiscal year.

DEER.

Through the protective force, the Department has ascertained that the supply of deer in the Adirondacks is greater than at any time during the past twenty-five years. From every section of the Adirondack region the protectors report a great increase in the number of deer — the increase no doubt being due in a great measure to the light fall of snow during the winter of 1911, which did not force the deer to yard up as in past winters; and due also to the experiment which was tried of cutting and stacking the marsh hay, on which the deer could feed during the more severe weather. This experiment has proven a marked success, and the Department has gone into it rather extensively this year. One of the State game protectors reports that in the vicinity of Long Lake West there was a very heavy fall of snow, and the deer died in great numbers; but on one marsh where hay was cut and salted, fifteen deer wintered at the three stacks of hay, and came out in the spring in fine shape.

The new law relative to the taking of bucks with horns not less than three inches in length has been tried in other States with success. Under this law a person is more liable to hesitate before shooting at a moving object, determining first whether it is a buck or a doe, thereby no doubt lessening the danger to human life. Statistics show this to be a fact. In States where does may be killed, the mortality is far in excess of that in those States where only bucks may be killed. Further it stands to reason that the does are the breeding stock, and should receive the most protection.

TAGGING OF FOREIGN GAME.

As required by section 373 of the Conservation Law, the tagging of foreign game has proven a wonderful success, and is being considered by many other states as the means of designating between the native game reserved for the sportsmen and the game that may be used for market purposes. Under the tagging system the State of New York receives five cents for every tag used, thereby having a considerable income as well as supervision of the industry. When game is imported, upon its arrival in this country a metal tag is immediately attached thereto, with a con-

secutive number upon it, a record of the number being noted by the Department. No matter how many sales have been made of said game, the date of importation and the name of the importer can always be determined by the number upon the tag. The tag can only be used once, as it cannot be removed without being destroyed. This does away with the incentive to violate the law, as it gives the dealer a right to sell imported tagged game openly the entire year.

During last year the following species of game have been imported and tagged:

34,849 pheasants;
20,387 Scotch grouse;
46,117 European black game;
66,357 European black plover;
45,214 European red legged partridge;
36,897 European quail,

making a total of 339,297 birds tagged.

In addition, there were 18 European red deer, which required six tags on each carcass, one tag for each quarter and one for each loin; also 1,471 fallow deer, 2,098 roebuck, and 150 American deer bred in captivity in the State of New York, giving a total of 3,728 deer tagged.

The number of native game held in storage during the close season of 1911 under bond was 149,176.

PHEASANTS.

Within recent years a new industry, the rearing of pheasants, has been given attention by this Department, also by private clubs, and is beyond the experimental stage. The sportsmen and land owners are making large demands upon the Commission for both pheasants and eggs. During the year 1912 the Department received applications for 28,261 pheasants and 126,361 eggs. Under the most favorable conditions the one State game farm would supply only thirty thousand eggs and five thousand birds. In filling aplications for pheasants or eggs, only those were sent where the application stated that the land was not posted. The Commission should continue to stock the covers of the State with

these splendid game birds for the benefit of the sportsment who pay into the State treasury annually approximately $150,000 for hunting licenses.

Chenango, Clinton, Delaware, Essex, Franklin, Fulton, Herkimer, Jefferson, Lewis, Madison, Montgomery, Oneida, Otsego, Schenectady, St. Lawrence, Warren and Washington counties have been given a close season on pheasants until the year 1914.

DUCK AND SNIPE.

The reports received from protectors in the different counties, and especially the counties of Long Island, state that during the past spring they have seen more duck, geese and snipe in the northern migration than have been seen in the past few years.

Reports received last year show that good duck shooting was had thoroughout the entire State. The increase of the ducks is due in a great measure to the law which prohibits spring shooting. This law should be continued in force.

QUAIL.

With the exception of Long Island, quail have become very scarce throughout the State, this being due partly to the fact that little or no assistance has been given to aid them in their propagation. I believe that a close season should be established on quail throughout the State for a period of not less than two years. If at the expiration of that time it is found that quail are multiplying, and it is deemed wise to do so, the period of the close season could be extended.

GROUSE.

Reports received in reference to grouse show beyond dispute that they are becoming plentiful in their old haunts; this being due to the fact that pot hunting is no more a profitable business, on account of the dealers in game substituting the Scotch grouse, which they may lawfully sell.

SPECIAL PROTECTORS.

At the present time there are about 260 special protectors in the State service, fifty of whom had one or more convictions to

their credit during the past year, and but twenty-five of those have done work which shows any special activity. Investigation shows that in a great many instances the appointment of a special protector is desired for personal reasons. Therefore, as suggested before, a non-competitive examination should be necessary before appointment is made, and the number of special protectors in the State should not exceed two hundred.

ANNUAL MEETING.

The annual meeting of the State game protective force was held in the Assembly chamber on June 4th and 5th; every regular protector in the State being represented, with the exception of one who was sick and presented a doctor's certificate. In addition there were a great many special protectors present. The meeting was pronounced, and was, a success from every standpoint, and the protectors derived much valuable information from the addresses made.

I wish at this time to call attention to the remarks made by Dr. Hornaday in his address to the protectors at the meeting. The doctor stated in opening, that: "We are here to-day because nine million good people of the state of New York believe in the game laws, and urgently and sincerely desire the preservation of the wild life of the great Empire State. This is a serious matter, or you would not be here. I think the time has come to thank God and take courage. Three years ago matters were not as they are now. The laws of this State were not nearly in as good condition as to-day. The army of destruction was pressing the wild life very hard; but the army of the defense was fighting all that it knew. And what is the state to-day? We have made great progress in the last two years, and have reason to be thankful for the progress we have made. There is no question about it, gentlemen. At this moment the State of New York, in these laws and in the personnel of its force for the enforcement of these laws, stands to-day pre-eminent among the States of the American nation. There is no doubt about it. I have lately secured the laws of all the States, and it is not an idle estimate that New York to-day stands foremost of all the States of the American nation in the quality and effectiveness of the game

laws, and as I fully believe, in the quality and effectiveness of its game protective force. Where can we find anywhere a Conservation Commission such as we have in the State of New York to-day? Where can we find such laws as the small gilt edged book placed in your hands contains? It is a great triumph, gentlemen."

The Doctor said in closing, that, "In the protection of wild life I believe it is impossible to be too aggressive; and in the pursuit of our mutual duties in that direction, we must follow the injunction of the Holy writ, 'Be constant in season and out of season.'"

BEAVER.

Beaver are rapidly increasing in the Adirondack region, and the department is receiving numerous complaints stating that considerable damage is being done by the beaver which cut the poplar trees on private lands. This refers particularly to the Fulton chain of lakes, on which there are a great many summer homes, and in which territory reports show that the beaver seem to be increasing very rapidly

HUNTING LICENSES.

There is no doubt that it was wise to provide for a combined hunting and trapping license, as I think it will be the means of increasing the sale of hunting licenses a number of thousands of dollars. Formerly there was no trapping license required, and a great many persons did not hunt, but did trap. Under the present law it will be necessary for a person who traps to have a license, and the combination of the hunting and trapping license was an excellent provision. This does not apply to a minor under the age of sixteen years, who may trap without having a license.

STATE GAME FARM.

Although the output of the one game farm at Sherburne was doubled over the former year, it was only able to fill 25 per cent of the applications made for pheasants and eggs. I would therefore respectfully recommend that the Commission endeavor to provide for four additional game farms.

GAME REFUGES.

It is gratifying to report that a great many additional game refuges have been established in the different parts of the State during the past year. The great increase in the number of hunters and the constant lessening of the game supply makes the game refuge a necessity; for in no other way can the breeding supply be well conserved. Such refuges furnish an admirable place for breeding purposes.

REDIVISION OF THE STATE.

The 1912 Legislature increased the force of protectors from ninety-five to one hundred and twenty-five men. It was therefore necessary to redivision the State, increasing the number of divisions from ten to twelve, and appointing additional division chief protectors, all of which was done. The several divisions are known as the Northern Adirondack, Southern Adirondack, Eastern Adirondack, Eastern, Western, Southern, Central New York, Hudson, St. Lawrence, Allegany, Ontario, and Metropolitan and Long Island division, and are placed in charge of competend division chiefs.

GREBES.

The following is a copy of a letter received from Dr. William T. Hornaday, director of the New York Zoological Park:

"Mr. LLEWELLYN LEGGE, *Chief Game Protector, Conservation Commission, Albany, N. Y.:*

"DEAR MR. LEGGE.—Thank you very much for the fine specimen of Holboell's Grebe (*Columbus holboelli*), which arrived here in good condition, and is doing well. It is not often that a grebe really settles down in captivity; but this bird promises to be an exception to the general rule. It is the only specimen of the kind that we have, or have had, for some time, and we are much pleased with it. We will also gradly welcome the loon, which your telegram of yesterday advises me is on the way. Loons, also, are difficult birds to keep alive in captivity; but, as usual, we shall do our best. I know of no water bird that is

quite so difficult to maintain in the zoological garden as a full-grown loon. Their nervous temperament makes them very difficult to manage.

"Yours very truly,
"W. T. HORNADAY,
"Director."

Respectfully submitted:
LLEWELLYN LEGGE,
Chief Game Protector.

SECTIONS OF THE FOREST, FISH AND GAME LAW VIOLATED FROM OCTOBER 1, 1911, TO APRIL 15, 1912

COUNTY	25	32	32a	42	76	77	78	78a	79	82	84	85a	87	88	89	91	92	94	96	96b
Albany																				
Allegany											2									
Broome											2									
Cattaraugus																				
Cayuga																			3	
Chatauqua											3									
Chemung			2							1	1									
Chenango											1					1				
Clinton									7										1	
Columbia					1															
Cortland																				
Delaware										1	2		1				1	2		
Dutchess											3	1								
Erie						3				7			2	1			1			
Essex	1			1	7	7			13	1									2	
Franklin					2	8	1		22		4									
Fulton									1	1										
Genesee										1			1						2	
Greene																1				
Hamilton					1	1	1		7											
Herkimer						1			3		1								1	
Jefferson	1								1		8	1		1		1			1	
Kings						2														
Lewis					1						1									
Livingston											6		4						1	
Madison														2						
Montgomery											1		1							
Monroe																			7	
Nassau													2							
New York						1							2		1		3		1	1
Niagara														1					7	
Oneida											4								1	
Onondaga											1		4							
Ontario																			7	
Orange						1					1									
Orleans																			3	
Oswego										1			1							
Otsego											3			4					2	
Putman																				

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SECTIONS OF THE FOREST, FISH AND GAME LAW VIOLATED FROM OCTOBER 1, 1911, TO APRIL 15, 1912 — (*Continued*)

COUNTY	98	100	103	104	105	106	107	108	109	110	112	115	117	119	120	122	124	125	126	127
Albany																				
Allegany				4																
Broome				2									1					1		
Cattaraugus																				
Cayuga				1																
Chatauqua				2																
Chemung				4																
Chenango				2																
Clinton				7		3		1	1									8		
Columbia	1			5				5			7		1					1		
Cortland																	2			
Delaware	2			4											1					
Dutchess				4							3				4			2		3
Erie				5														2		
Essex	1			7		1		1												
Franklin	2			7		2	2													
Fulton	2			1				1												
Genesee	2			4																
Greene	1			2																
Hamilton				3														1		
Herkimer				10													5	3		
Jefferson	1			6	1															
Kings				1																
Lewis				1												1		2		
Livingston				4												1		5		
Madison	1		2	9								1								
Montgomery	1			3														10		
Monroe	2			6																
Nassau	3		1	7										1						
New York	4		1			1												1	1	
Niagara	1			7														4		
Oneida	2			7				3			7							1		
Onondaga	5	1		17																
Ontario				5														1		
Orange																		4		
Orleans				2												1		3		
Oswego	2			4														5		
Otsego	1																			
Putnam																				
Queens	4			1																
Rensselaer	1																			

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SECTIONS OF THE FOREST, FISH AND GAME LAW VIOLATED FROM OCTOBER 1, 1911, TO APRIL 15, 1912 — (*Concluded*)

COUNTY	128	131	132	134	135	141	143	148	153	154	164	168	169	170	171	177	180	205	206	240	Total
Albany																					6
Allegany																					6
Broome																					
Cattaraugus																					4
Cayuga																					5
Chautauqua																					8
Chemung																					4
Chenango																					28
Clinton																					23
Columbia		1			1																2
Cortland									7												21
Delaware																					20
Dutchess																1		1			23
Erie																					40
Essex																					50
Franklin																					7
Fulton										1											10
Genesee																					4
Greene																					14
Hamilton			1																		17
Herkimer																					32
Jefferson			2															7			10
Kings																					3
Lewis																					18
Livingston																					20
Madison																					7
Montgomery																					25
Monroe														3							16
Nassau																		1			17
New York																					18
Niagara																				1	29
Oneida																					29
Onondaga																					12
Ontario																					3
Orange																					10
Orleans					1																13
Oswego					1																15
Otsego																					
Putnam																					5
Queens																					4
Rensselaer																					

| | | |

SECTIONS OF THE CONSERVATION LAW VIOLATED FROM APRIL 15, 1912, TO SEPTEMBER 30, 1912

COUNTY	153	164	175	176	177	178	181	185	186	190	191	193	195	196	198	199	201	202	211	213
Albany				1																
Allegany					1			1												
Broome																				
Cattaraugus																				
Cayuga																			1	
Chatauqua								2										1		
Chemung					1			1												1
Chenango					1			9												
Clinton					9			2												
Columbia																				
Cortland				2																
Delaware				1				2												
Dutchess			2	2				2												
Erie				7				1											3	
Essex					1			9			5									
Franklin	2				3			3		1		2		1						
Fulton				4										1						
Genesee								2												
Greene				1																
Hamilton				1				2		2	1									
Herkimer								2									1			
Jefferson					2			2									1			
Kings																				
Lewis				2	9															
Livingston								4					2							
Madison					1			2												
Montgomery								3					1							
Monroe					4			1												
Nassau								9												1
New York																				
Niagara																				
Oneida				1	4			9						1						5
Ontario					7			1												
Onondaga				2	5			5												
Orange																				
Orleans								2											2	
Oswego				1		2		1											2	
Otsego				7	2										1				2	
Putnam								1												

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SECTIONS OF THE CONSERVATION LAW VIOLATED FROM APRIL 15, 1912, TO SEPTEMBER 30, 1912 — (*Continued*)

COUNTY	214	216	217	219	220	230	231	232	234	236	237	240	243	244	245	246	247	249	254	255
Albany								1												
Allegany						1														
Broome																				
Cattaraugus																			1	
Cayuga				1																
Chautauqua				1										1						
Chemung				1			2						1						4	7
Chenango																				
Clinton								3											1	
Columbia						1	2													
Cortland								1											1	
Delaware							5	2							4		5		3	
Dutchess				1			2													
Erie				2			9								1				3	1
Essex	2			5		1		5												
Franklin								14	2		3				5				3	
Fulton																				
Genesee							1													
Greene				2	2															
Hamilton								3												
Herkimer	1						1	3			1								7	3
Jefferson																2		3	1	2
Kings				1																
Lewis							1	2												
Livingston				1		2	3								1					1
Madison											1								2	2
Montgomery					1		1												2	
Monroe	1			3																
Nassau				3				1												
New York												4			2					1
Niagara	2														3					2
Oneida	1			1			1	4												
Ontario				1																
Onondaga		1	1	6			2			1	2								15	7
Orange				2			1													
Orleans																				
Oswego				3																
Otsego				1																
Putnam						1	2												1	
Queens																				
Rensselaer							2													

Richmond							2													
Rockland							1											2		
St. Lawrence							1	4		2	2									
Saratoga						2		1										2		
Schenectady				1																
Schoharie																1				1
Schuyler																				
Seneca																				
Steuben				1																
Suffolk							2													
Sullivan	2					2	1													1
Tioga																				
Tompkins							3									1	3	2		
Ulster				1		1		6								2		6	2	
Warren	1						4	2			5							2	3	
Washington						1		2										5		
Wayne							1													
Westchester							12													
Wyoming				1														1		
Yates																		2	1	
Total	10	1	1	39	3	12	62	54	2	3	14	4	1	1	16	2	9	6	66	36

SECTIONS OF THE CONSERVATION LAW VIOLATED FROM APRIL 15, 1912, TO SEPTEMBER 30, 1912 — (*Concluded*)

COUNTY	256	257	258	270	273	274	275	276	277	279	282	284	321	324	332	380	384	Total
Albany		2																4
Allegany																		3
Broome				1														2
Cattaraugus																		
Cayuga				2			2											7
Chatauqua							2											17
Chemung																		7
Chenango																		11
Clinton				2							2							18
Columbia				1														4
Cortland																		4
Delaware																		22
Dutchess										1								10
Erie				10					9									41
Essex											1							34
Franklin																		39
Fulton																		5
Genesee																		3
Greene					3													8
Hamilton																		9
Herkimer																		19
Jefferson																		13
Kings													6					7
Lewis																		14
Livingston				1							4							19
Madison																		8
Montgomery																		8
Monroe							2	3										14
Nassau															4			18
New York													3	2				9
Niagara				1					4									10
Oneida		4		6														42
Ontario				1														10
Onondaga				8														55
Orange																		3
Orleans																		4
Oswego	1																	10
Otsego											3							16
Putnam				1														6
Queens													4					4
Rensselaer				1														5

Richmond													1					3
Rockland				2			1											10
St. Lawrence				4														24
Saratoga				2														10
Schenectady												2				2	1	7
Schoharie																		8
Schuyler																		7
Seneca																		4
Steuben			2				2											24
Suffolk													5	5				15
Sullivan																		7
Tioga																		13
Tompkins																		12
Ulster				4		2	1											32
Warren				8														31
Washington		2		3														26
Wayne																		10
Westchester				1														24
Wyoming																		4
Yates				1														6
Total	1	8	2	60	3	2	10	3	13	1	10	2	19	7	4	2	1	819

REGULAR PROTECTORS

DIVISION	Number of men in division	Total number of actions	Average number of cases per protector	Gross recovery	Average recovery per case	Total cost	Average cost per case
Metropolitan and Long Island Division, J. T. McCormick, Division Chief	18	231	13	$4,136 55	$17 91	$526 77	$2 28
Southern Division, W. C. Farley, Division Chief	14	198	14	3,503 00	17 69	346 16	1 75
Northern Adirondack Division, B. A. Cameron, Division Chief	11	195	18	3,799 55	19 48	566 61	2 85
St. Lawrence Division, F. C. Mullin, Division Chief	15	139	9	2,346 15	16 87	179 90	1 29
Eastern Adirondack Division, R. B. Nichols, Division Chief	11	127	12	1,806 95	14 23	398 90	3 14
Central New York Division, W. H. Weston, Division Chief	11	122	11	2,568 50	21 05	271 10	2 22
Allegany Division, C. R Stapley, Division Chief	8	113	14	1,985 20	17 57	160 20	1 42
Ontario Division, C. T. DoVille, Acting Division Chief	9	112	12	2,581 30	23 05	515 00	4 60
Western Division, F. W. Hamilton, Division Chief	12	85	7	1,648 80	19 40	310 70	3 65
Hudson Division, Chas. E. Lee, Division Chief	9	75	8	1,448 65	19 31	129 20	1 72
Southern Adirondack Division, J. E. Leavitt, Division Chief	7	59	8	1,785 22	30 26	87 35	1 48
Eastern Division, C. A. Johnston, Division Chief	8	59	7	1,149 35	19 48	252 44	4 28
Average recovery and cost per case					$18 98		$2 46

SPECIAL PROTECTORS

DIVISION	Number of men in division	Total number of actions	Average number of cases per protector	Gross recovery	Average recovery per case	Total cost	Average cost per case
Metropolitan and Long Island Division, J. T. McCormick, Division Chief	3	6	2	$273 50	$45 59	$31 40	$5 23
Southern Division, W. C. Farley, Division Chief	2	2	1	40 00	20 00	5 00	2 50
Northern Adirondack Division, B. A. Cameron, Division Chief	2	15	7	312 75	20 85	40 75	2 72
St. Lawrence Division, F. C. Mullin, Division Chief	5	14	3	375 25	25 52	44 40	3 17
Eastern Adirondack Division, R. B. Nichols, Division Chief	4	10	3	188 00	18 80	61 55	6 15
Central New York Division, W. H. Weston, Division Chief	7	57	8	1,335 65	23 43	222 35	3 90
Allegany Division, C. R. Stapley, Division Chief	6	10	3	165 00	16 50	15 75	1 57
Ontario Division, C. T. DoVille, Acting Division Chief	7	22	3	727 00	33 05	137 02	6 23
Western Division, F. W. Hamilton, Division Chief	6	25	4	329 95	13 20	44 65	1 79
Hudson Division, Chas. E. Lee, Division Chief	2	4	2	75 00	18 75	6 00	1 50
Southern Adirondack Division, J. E. Leavitt, Division Chief	5	9	2	93 50	10 39	18 05	2 01
Eastern Division, C. A. Johnston, Division Chief	5	6	1	156 45	26 08	4 70	79
Average recovery and cost per case					$22 52		$3 51

SUMMARY OF RECOVERIES AND EXPENSES

	SUMMARY OF RECOVERIES AND EXPENSES	
	Fines and penalties	Expenses of prosecution
Regular protectors	$28,759 22	$3,735 33
Special protectors	4,054 05	631 62
Total	$32,813 27	$4,366 95

SUMMARY OF RESULTS OF ACTIONS BROUGHT

	SUMMARY OF RESULTS OF ACTIONS BROUGHT		
	Regular protectors	Special protectors.	Total
Fined	1,302	161	1,463
Sent to jail	32	4	36
John Doe proceedings	45	2	47
Sentence suspended	56	5	61
Acquitted	40	7	47
Discontinued	37	.....	37
Jury disagreed	3	1	4
Total	1,515	180	1,695

Note:
Actions brought by regular protectors for fire and trespass cases in addition to game cases.

PROTECTOR	No. of actions	Recovery
J. H. Kane	8	$80 00
Robert Somerville	2	227 00
D. W. Seckington	1	1,250 00
Total		$1,557 00

The amount of $1,557.00 is not included in the $32,813.27 which was collected for fines and penalties.

REPORT OF THE CHIEF GAME PROTECTOR

REGULAR PROTECTORS	Actions brought	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
J. T. McCormick, Division Chief	15	$417 50	$6 15	$1 95	.....	.....	$8 10
W. C. Farley, Division Chief	2	85 50	50	.....	.....	.....	50
B. A. Cameron, Division Chief	26	735 15	67 70	12 80	$15 00	.....	88 50
F. C. Mullin, Division Chief	15	236 40	9 70	2 00	15 80	.....	27 50

REPORT OF THE CHIEF GAME PROTECTOR — (*Continued*)

REGULAR PROTECTORS	Actions brought	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
R. B. Nichols, Division Chief	3	$88 50	$1 50	.....	.....	.....	$1 50
W. H. Weston, Division Chief	5	210 00	10 00	.....	.....	.....	10 00
C. R. Stapley, Division Chief	35	592 60	36 50	$2 80	.....	.....	39 30
C. T. DoVille, Acting Division Chief	22	514 30	32 10	8 90	.....	$0 10	41 10
F. W. Hamilton, Division Chief	49	985 45	72 25	13 45	$21 50	.....	107 20
C. E. Lee, Division Chief	13	97 70	19 65	4 30	30 00	.....	53 95
J. E. Leavitt, Division Chief	.....	.....	.....	.....	.....	.....	.....
C. A. Johnston, Division Chief	4	45 00	71 25	.....	.....	.....	71 25
T. H. Allen	13	257 85	31 65	13 40	41 34	.....	86 39
W. J. Andre	10	157 50	7 50	.....	.....	.....	7 50
R. A. Bachman	4	71 75	6 65	1 10	.....	.....	7 75
B. M. Bailey	6	60 00	2 60	.....	.....	.....	2 60
J. E. Ball	.....	.....	.....	.....	.....	.....	.....
Joseph Barry	6	74 25	4 25	.....	.....	.....	4 25
F. Bauerschmidt	5	71 50	1 50	.....	.....	.....	1 50
C. A. Beebe	16	256 50	12 50	.....	.....	.....	12 50
W. G. Bell	28	417 50	17 50	.....	.....	.....	17 50
F. H. Bellinger	4	81 75	1 75	.....	.....	.....	1 75
C. A. Bennett	14	239 20	37 65	7 75	.....	.....	45 40
D. H. W. Benson	18	373 40	29 30	8 35	17 52	.....	55 17
E. J. Birch	5	167 75	2 75	.....	.....	.....	2 75
C. A. Bissell	1	10 50	50	.....	.....	.....	50
J. W. Broderick	9	147 00	14 35	2 40	10 00	.....	26 75
W. H. Burnett	25	379 45	42 75	.....	.....	.....	42 75
Patrick Butler	4	112 90	7 99	.....	.....	.....	7 99
L. H. Burnside	13	210 05	10 05	.....	.....	.....	10 05
W. J. Butler	7	140 50	10 00	2 95	10 00	.....	22 95
M. J. Callahan	6	63 75	12 70	.....	10 00	.....	22 70
Z. T. Cater	17	313 45	43 00	.....	14 00	.....	57 00
W. R. Clark	3	135 00	1 85	3 00	.....	.....	4 85
W. D. Cloyes	10	103 25	5 25	.....	.....	.....	5 25
J. A. Colloton	21	332 00	11 15	13 75	.....	.....	24 90
A. J. Conklin	6	70 00	3 00	.....	.....	.....	3 00
E. C. Cross	11	346 95	11 70	16 50	.....	.....	28 20
H. B. Cruikshank	24	333 50	112 70	33 55	15 50	.....	161 75
C. C. Culver	15	176 70	24 15	3 75	10 00	2 50	40 40
A. E. Davis	3	31 50	1 50	.....	.....	.....	1 50
W. L. Delaney	1	.....	9 30	22 25	30 00	.....	61 55
J. M. DeSilva	30	492 55	21 90	15 45	.....	.....	37 35
Fred Dewitt	16	342 25	12 25	.....	.....	.....	12 25
H. C. DeWolf	9	187 50	16 00	.....	.....	1 50	17 50
J. Dollinger	3	36 50	1 50	.....	.....	.....	1 50
E. B. Downing	14	262 00	21 00	.....	.....	.....	21 00
Calvin Emerick	11	206 80	12 95	.....	10 00	.....	22 95
P. S. Farnham	1	27 50	2 50	.....	.....	.....	2 50
Geo. Davis	.....	.....	.....	.....	.....	.....	.....
C. J. Franklin	.....	.....	.....	.....	.....	.....	.....
I. E. Featherston	6	188 25	10 83	4 85	5 00	.....	20 68
J. S. Ford	53	996 75	75 30	21 35	10 00	.....	106 65
E. Gallagher	24	493 45	27 85	8 95	17 52	.....	54 32
E. H. Gammon	25	605 75	101 70	49 20	114 90	.....	265 80
Edward Geenan	6	107 50	16 45	12 50	20 00	.....	48 95
J. A. Ginder	9	314 50	19 45	8 80	.....	.....	28 25
E. C. Gleason	25	601 50	20 70	.....	.....	.....	20 70
R. Hume Grant	10	335 00	5 00	.....	.....	.....	5 00
H. P. Haff	31	602 80	42 20	21 50	5 00	.....	68 70
J. Hand	13	222 50	14 00	3 50	.....	.....	17 50
M. Hazelton	9	273 75	11 15	.....	10 00	.....	21 15
H. Heffernan	15	310 40	15 40	.....	.....	.....	15 40
W. Herrick	2	34 00	4 00	.....	.....	.....	4 00
E. Hicks	11	560 00	.....	.....	.....	.....	.....
C. M. Hiller	7	69 10	4 10	.....	.....	.....	4 10
W. C. Hodge	25	446 35	34 95	1 35	10 00	.....	46 30
Fred Hoffman	8	156 50	21 00	7 50	40 00	.....	68 50

REPORT OF THE CHIEF GAME PROTECTOR — (*Continued*)

REGULAR PROTECTORS	Actions brought	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
H. A. Horton	20	$357 50	$23 50	$6 10	$10 00	.....	$39 60
W. H. Irons	11	187 70	19 80	8 80	10 00	.....	38 60
W. A. Hoagland	4	61 50	9 60	.....	.....	.....	9 60
J. F. Hirsch	.....	.....	.....	.....	.....	.....	.....
R. M. Hudson	.....	.....	.....	.....	.....	.....	.....
J. H. Hildreth	.....	.....	.....	.....	.....	.....	.....
J. Jenkins	8	102 10	3 10	.....	.....	.....	3 10
J. H. Kane	25	434 95	22 20	.....	15 00	$7 00	44 20
D. E. Keefe	3	51 80	1 80	.....	.....	.....	1 80
W. Kidd	6	158 60	20 15	8 25	.....	.....	28 40
E. Kinsman	2	25 75	3 05	.....	.....	.....	3 05
C. J. Kirby	14	135 75	10 05	.....	.....	.....	10 05
E. J. Knapp	9	77 80	17 85	.....	.....	.....	17 85
P. Knobloch	9	320 10	30 55	10 25	13 00	95	54 75
M. B. Leland	12	185 00	10 75	.....	.....	.....	10 75
R. F. Maher	13	153 80	20 40	.....	.....	.....	20 40
J. H. Mallett	2	20 50	50	.....	.....	.....	50
F. E. Marsh	3	47 85	2 85	.....	.....	.....	2 85
C. H. Masten	4	92 60	2 60	.....	.....	.....	2 60
L. S. Morris	7	57 05	2 05	.....	.....	.....	2 05
D. E. Moxley	8	183 25	13 60	4 50	.....	.....	18 10
M. C. Murphy	6	84 75	4 75	.....	.....	.....	4 75
J. J. McDonough	.....	.....	.....	.....	.....	.....	.....
C. J. Miles	.....	.....	.....	.....	.....	.....	.....
W. F. Newell	23	429 00	23 65	14 40	11 70	2 00	51 75
J. H. North	11	142 25	12 25	.....	16 00	.....	28 25
J. Northrup	8	148 04	7 00	.....	.....	.....	7 00
C. O'Donnell	4	175 75	5 75	.....	.....	.....	5 75
E. R. Overton	32	242 50	31 55	.....	32 00	2 00	65 55
A. O. Perkins	22	254 80	35 25	15 66	20 00	.....	70 91
B. W. Philbrick	6	96 00	9 75	.....	.....	.....	9 75
W. L. Reed	17	472 95	30 50	8 00	.....	.....	38 50
Chas. Riley	16	260 85	24 50	14 35	15 00	.....	53 85
W. H. Ronald	5	131 50	13 30	13 20	.....	.....	26 50
J. V. Sauter	1	30 00	.....	.....	.....	.....	.....
N. A. Scott	5	51 00	4 60	.....	.....	.....	4 60
S. S. Scott	5	68 50	3 50	.....	.....	.....	3 50
D. W. Seckington	38	929 35	77 55	47 45	87 18	.....	212 18
T. J. Sheridan	9	98 00	15 55	2 00	25 00	.....	42 55
M. S. Smith	8	161 40	15 40	.....	.....	.....	15 40
J. T. Smith	4	167 25	9 00	14 55	10 00	.....	33 55
R. Somerville	6	52 50	7 40	14 50	.....	.....	21 90
D. C. Speenburg	5	170 00	.....	.....	.....	.....	.....
G. E. Sutton	20	223 00	28 00	.....	.....	5 00	33 00
E. St. Clair	4	62 45	5 90	.....	.....	.....	5 90
S. S. Taylor	3	79 00	6 75	.....	.....	.....	6 75
F. G. Thomas	18	155 00	21 95	.....	.....	.....	21 95
G. H. Travis	27	488 70	33 20	1 50	40 00	.....	74 70
C. E. Underhill	2	21 00	1 00	.....	.....	.....	1 00
J. B. Vann	27	385 45	42 40	1 55	35 00	.....	78 95
P. Ver Snyder	3	52 25	2 25	.....	.....	.....	2 25
J. H. Wackerman	7	76 50	12 25	3 95	23 84	.....	40 04
J. J. Ward	1	25 00	.....	.....	.....	.....	.....
R. E. Warren	31	347 00	40 85	12 80	10 00	.....	63 65
M. Westcott	15	196 05	13 90	3 25	.....	.....	17 15
C. Wheaton	9	732 02	4 00	.....	.....	.....	4 00
A. P. Williams	14	253 20	7 00	.....	.....	.....	7 00
J. Willis	11	465 70	26 85	11 20	62 50	.....	100 55
O. C. Woolf	20	469 75	23 20	4 15	37 00	.....	60 35
C. G. Worden	27	452 55	24 90	10 20	5 00	2 50	42 60
M. C. Worts	2	50 00	.....	.....	10 00	.....	10 00
F. Van De Boe	.....	.....	.....	.....	.....	.....	.....
C. H. Yaple	23	337 35	21 35	.....	.....	.....	21 35
V. A. Zimmer	3	50 50	4 35	4 20	.....	.....	8 55
Total	1,515	$28,759 22	$2,175 77	$564 71	$971 30	$23 55	$3,735 33

REPORT OF THE CHIEF GAME PROTECTOR — (*Continued*)

SPECIAL PROTECTORS	Actions brought	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
B. J. Anson	19	$492 50	$52 20	27 80	$47 40	$21 10	$148 50
H. T. Ashton	1	17 45	1 70				1 70
L. Bardo	5	86 40	17 45	20 15			37 60
J. D. Black	2	79 00	4 00				4 00
F. E. Blossom	1	21 00	1 00		5 00		6 00
F. Bradley	3	73 50	6 90	1 00			7 90
G. Brier	7	79 25	8 25				8 25
W. H. Bundenthal	14	311 00	24 00	2 00			26 00
B. T. Burnett	1	16 00	1 00				1 00
P. F. Butler	1	76 00					
E. Chamberlain	1	22 00	3 00	4 00			7 00
A. J. Clark	2	51 50	1 50				1 50
H. J. Clifford	3						
F. E. Coats	1	15 00	1 75				1 75
Henry Con	1	10 00					
J. T. Concannon	1	26 00	1 00				1 00
A. Cooper	1	10 00			2 00		2 00
Howard Davidson	2	36 50	4 50		10 00		14 50
A. Dubois	1	16 60	1 60				1 60
A. Ells	1	25 85	85				85
B. Everingham	9	208 00	14 00	4 00			18 00
E. R. Fish	1	26 00	1 00				1 00
W. R. Floyd	3	62 25	7 95				7 95
A. C. Frederick	1	10 00	2 00				2 00
E. W. Gauding	3	32 75	2 75				2 75
C. Gould	3	38 75	8 75			20	8 95
J. Graham	2	120 00					
J. R. Hegeman, Jr	1	80 00			23 50		23 50
W. A. Hoagland	3	103 65	8 75	4 90			13 65
F. Houston	2	38 00	1 50	1 50			3 00
W. H. Jackson	2	40 00					
H. L. Jenning	1	50 00	1 95				1 95
F. E. Johnson	1	30 50	50				50
F. H. Kemp	3	35 00	5 50				5 50
F. J. Maloney	6	66 50	7 25				7 25
C. H. Masten	1	50 75	75				75
J. E. Moak	1		4 50	8 05			12 55
R. L. Moore	2	20 00	4 50				4 50
S. M. Perry	1	25 00	1 25		2 00		3 25
F. E. Pitts	5	107 00	8 50	3 55	8 00		20 05
A. J. Roberts	1	26 50	1 50				1 50
W. S. Rutherford	6	171 90	6 50	9 50			16 00
F. T. Schmidt	10	410 00	38 05	11 10	30 00	72	79 87
A. Stadlmier	5	96 70	6 70				6 70
W. M. Stearns	13	276 25	23 70	2 55			26 25
R. S. Suor	6	46 00	6 00				6 00
A. S. Temple	5	111 00	8 35	28 20	17 50		54 05
F. P. Viele	1	13 00	3 00				3 00
L. H. Weed	3	65 00	4 00				4 00
F. A. Weichbrodt	2	18 00	6 00				6 00
H. Wilcox	8	102 00	17 00				17 00
L. S. Wood	1	108 00	3 00				3 00
Total	180	$4,054 05	$335 90	$128 30	$145 40	$22 02	$631 62

RESULTS OF ACTIONS

REGULAR PROTECTORS	Fined	Sentence suspended	Jail	Acquitted	J. Doe proceedings	Discontinued	Jury disagreed	Total
J. T. McCormick, division chief	14		1					15
W. C. Farley, division chief	2							2
B. A. Cameron, division chief	24			1	1			26
F. C. Mullin, division chief	14			1				15
R. B. Nichols, division chief	3							3
W. H. Weston, division chief	5							5
C. R. Stapley, division chief	31	4						35
C. T. DoVille, acting division chief	18		1		3			22
F. W. Hamilton, division chief	40	4		3	2			49
C. E. Lee, division chief	7			3		3		13
J. E. Leavitt, division chief								
C. A. Johnston, division chief	3		1					4
T. H. Allen	11			2				13
W. J. Andre	10							10
R. A. Bachman	4							4
B. M. Bailey	6							6
J. E. Ball								
Jos. Barry	5	1						6
F. Bauerschmidt	3	1	1					5
C. A. Beebe	14	2						16
W. G. Bell	28							28
F. H. Bellinger	4							4
C. A. Bennett	14							14
D. H. W. Benson	15	1	1	1				18
E. J. Birch	5							5
C. A. Bissell	1							1
J. W. Broderick	9							9

RESULTS OF ACTIONS — (*Continued*)

REGULAR PROTECTORS	Fined	Sentence suspended	Jail	Acquitted	J. Doe proceedings	Discontinued	Jury disagreed	Total
W. H. Burnett	19	1	.....	.....	5	.....	.....	25
L. H. Burnside	13	.....	.....	.....	.....	.....	.....	13
Patrick Butler	4	.....	.....	.....	.....	.....	.....	4
W. J. Butler	6	.....	1	.....	.....	.....	.....	7
M. J. Callahan	6	.....	.....	.....	.....	.....	.....	6
Z. T. Cater	13	.....	.....	.....	1	3	.....	17
W. R. Clark	3	.....	.....	.....	.....	.....	.....	3
W. D. Cloyes	9	1	.....	.....	.....	.....	.....	10
J. A. Colloton	16	2	.....	3	.....	.....	.....	21
A. J. Conklin	5	.....	1	.....	.....	.....	.....	6
E. C. Cross	11	.....	.....	.....	.....	.....	.....	11
H. B. Cruikshank	16	2	1	.....	.....	5	.....	24
C. C. Culver	14	.....	.....	1	.....	.....	.....	15
A. E. Davis	3	.....	.....	.....	.....	.....	.....	3
W. L. Delaney	.....	.....	.....	1	.....	.....	.....	1
J. M. DeSilva	26	.....	1	.....	3	.....	.....	30
Fred DeWitt	14	1	1	.....	.....	.....	.....	16
H. C. DeWolf	8	.....	1	.....	.....	.....	.....	9
J. Dollinger	3	.....	.....	.....	.....	.....	.....	3
E. B. Downing	13	.....	.....	.....	.....	.....	1	14
C. Emerick	11	.....	.....	.....	.....	.....	.....	11
P. S. Farnham	1	.....	.....	.....	.....	.....	.....	1
I. E. Featherston	5	.....	.....	.....	1	.....	.....	6
J. S. Ford	43	.....	.....	.....	10	.....	.....	53
E. Gallagher	20	2	1	1	.....	.....	.....	24
E. H. Gammon	19	.....	5	.....	.....	.....	1	25
Edward Geenan	5	1	.....	.....	.....	.....	.....	6

J. A. Ginder	8	1						9
E. C. Gleason	23	1			1			25
R. Hume Grant	10							10
Henry P. Haff	23		1			7		31
J. Hand	13							13
M. Hazelton	8		1					9
Henry Heffernan	15							15
William Herrick	2							2
E. Hicks	9	1	1					11
C. M. Hiller	7							7
J. F. Hirsch								
J. H. Hildreth								
R. N. Hudson								
W. C. Hodge	23	2						25
Fred Hoffman	8							8
H. A. Horton	13	1				6		20
W. H. Irons	8	1		1		1		11
W. A. Hoagland	3		1					4
J. Jenkins	8							8
J. H. Kane	24				1			25
D. E. Keefe	3							3
W. Kidd	6							6
E. Kinsman	1					1		2
C. J. Kirby	12	2						14
E. J. Knapp	6	2	1					9
P. Knobloch	8						1	9
M. B. Leland	10	1			1			12
R. F. Maher	13							13
J. H. Mallett	2							2
T. E. Marsh	3							3
C. H. Masten	4							4
L. S. Morris	5	1			1			7
D. E. Moxley	7				1			8
M. C. Murphy	6							6
J. J. McDonough								
C. J. Miles								

RESULTS OF ACTIONS — (*Continued*)

REGULAR PROTECTORS	Fined	Sentence suspended	Jail	Acquitted	J. Doe proceedings	Discontinued	Jury disagreed	Total
W. F. Newell	20	.....	1	.....	1	1	.....	23
J. H. North	10	.....	.....	1	.....	.....	.....	11
J. Northrup	8	.....	.....	.....	.....	.....	.....	8
C. O'Donnell	4	.....	.....	.....	.....	.....	.....	4
E. R. Overton	19	2	.....	2	.....	9	.....	32
A. O. Perkins	16	3	.....	1	2	.....	.....	22
B. W. Philbrick	6	.....	.....	.....	.....	.....	.....	6
W. L. Reed	16	.....	1	.....	.....	.....	.....	17
Chas. Riley	13	1	.....	1	1	.....	.....	16
W. H. Ronald	3	.....	2	.....	.....	.....	.....	5
J. V. Sauter	1	.....	.....	.....	.....	.....	.....	1
N. A. Scott	3	.....	.....	1	1	.....	.....	5
S. S. Scott	5	.....	.....	.....	.....	.....	.....	5
D. W. Seckington	35	.....	.....	.....	3	.....	.....	38
T. J. Sheridan	7	.....	.....	1	1	.....	.....	9
M. S. Smith	8	.....	.....	.....	.....	.....	.....	8
J. T. Smith	4	.....	.....	.....	.....	.....	.....	4
R. Somerville	5	.....	.....	1	.....	.....	.....	6
D. C. Speenburg	5	.....	.....	.....	.....	.....	.....	5
G. E. Sutton	17	3	.....	.....	.....	.....	.....	20
E. St. Clair	4	.....	.....	.....	.....	.....	.....	4
S. S. Taylor	2	.....	1	.....	.....	.....	.....	3
F. G. Thomas	11	4	.....	1	2	.....	.....	18
G. H. Travis	25	1	.....	1	.....	.....	.....	27
C. E. Underhill	2	.....	.....	.....	.....	.....	.....	2
J. B. Vann	21	2	1	1	2	.....	.....	27
F. Van de Boe	.....	.....	.....	.....	.....	.....	.....	.....

P. Ver Snyder	3	.....	.....	.....	.....	.....	.....	3
J. H. Wackerman	6	.....	.....	1	.....	.....	.....	7
J. J. Ward	1	.....	.....	.....	.....	.....	.....	1
R. E. Warren	22	4	1	2	1	1	.....	31
M. Westcott	14	.....	1	.....	.....	.....	.....	15
C. Wheaton	9	.....	.....	.....	.....	.....	.....	9
A. P. Williams	14	.....	.....	.....	.....	.....	.....	14
J. Willis	11	.....	.....	.....	.....	.....	.....	11
O. C. Woolf	19	.....	.....	1	.....	.....	.....	20
C. G. Worden	20	.....	1	6	.....	.....	.....	27
M. C. Worts	1	.....	.....	1	.....	.....	.....	2
C. H. Yaple	22	.....	1	.....	.....	.....	.....	23
V. A. Zimmer	3	.....	.....	.....	.....	.....	.....	3
Total	1,302	56	32	40	45	37	3	1,515

RESULTS OF ACTIONS — (*Concluded*)

SPECIAL PROTECTORS	Fined	Sentence suspended	Jail	Acquitted	J. Doe proceedings	Discontinued	Jury disagreed	Total
B. J. Anson	17	.....	1	1	.....	.....	.....	19
H. T. Ashton	1	.....	.....	.....	.....	.....	.....	1
L. Bardo	4	.....	.....	1	.....	.....	.....	5
J. D. Black	2	.....	.....	.....	.....	.....	.....	2
F. E. Blossom	1	.....	.....	.....	.....	.....	.....	1
F. Bradley	3	.....	.....	.....	.....	.....	.....	3
G. Brier	7	.....	.....	.....	.....	.....	.....	7
W. H. Bundenthal	13	.....	.....	.....	1	.....	.....	14
B. T. Burnett	1	.....	.....	.....	.....	.....	.....	1
P. F. Butler	1	.....	.....	.....	.....	.....	.....	1
E. Chamberlin	1	.....	.....	.....	.....	.....	.....	1
A. J. Clark	2	.....	.....	.....	.....	.....	.....	2
H. J. Clifford	.....	.....	.....	3	.....	.....	.....	3
F. E. Coats	1	.....	.....	.....	.....	.....	.....	1
Henry Con	1	.....	.....	.....	.....	.....	.....	1
J. F. Concannon	1	.....	.....	.....	.....	.....	.....	1
A. Cooper	1	.....	.....	.....	.....	.....	.....	1
H. Davidson	2	.....	.....	.....	.....	.....	.....	2
A. Dubois	1	.....	.....	.....	.....	.....	.....	1
A. Ells	1	.....	.....	.....	.....	.....	.....	1
B. Everingham	8	1	.....	.....	.....	.....	.....	9
E. R. Fish	1	.....	.....	.....	.....	.....	.....	1
W. R. Floyd	2	1	.....	.....	.....	.....	.....	3
A. C. Frederick	1	.....	.....	.....	.....	.....	.....	1
E. W. Gauding	3	.....	.....	.....	.....	.....	.....	3
C. Gould	3	.....	.....	.....	.....	.....	.....	3
J. Graham	2	.....	.....	.....	.....	.....	.....	2

J. R. Hegeman, Jr.	1	.....	.....	.....	.....	.....	.....	1
W. A. Hoagland	3	.....	.....	.....	.....	.....	.....	3
F. Houston	2	.....	.....	.....	.....	.....	.....	2
W. H. Jackson	2	.....	.....	.....	.....	.....	.....	2
H. L. Jenning	1	.....	.....	.....	.....	.....	.....	1
F. E. Johnson	1	.....	.....	.....	.....	.....	.....	1
F. H. Kemp	3	.....	.....	.....	.....	.....	.....	3
F. J. Maloney	5	1	.....	.....	.....	.....	.....	6
C. H. Masten	1	.....	.....	.....	.....	.....	.....	1
J. E. Moak	.....	.....	.....	.....	1	.....	.....	1
R. L. Moore	2	.....	.....	.....	.....	.....	.....	2
S. M. Perry	1	.....	.....	.....	.....	.....	.....	1
F. E. Pitts	5	.....	.....	.....	.....	.....	.....	5
A. J. Roberts	1	.....	.....	.....	.....	.....	.....	1
W. S. Rutherford	6	.....	.....	.....	.....	.....	.....	6
F. T. Schmidt	8	.....	1	.....	.....	.....	1	10
A. Stadlmier	4	1	.....	.....	.....	.....	.....	5
W. M. Stearns	13	.....	.....	.....	.....	.....	.....	13
R. S. Suor	4	1	.....	1	.....	.....	.....	6
A. S. Temple	3	.....	1	1	.....	.....	.....	5
F. P. Viele	1	.....	.....	.....	.....	.....	.....	1
L. H. Weed	3	.....	.....	.....	.....	.....	.....	3
F. A. Weichbrodt	1	.....	1	.....	.....	.....	.....	2
H. Wilcox	8	.....	.....	.....	.....	.....	.....	8
L. S. Wood	1	.....	.....	.....	.....	.....	.....	1
Total	161	5	4	7	2	.....	1	180

RECORD OF DIVISIONS, REGULAR PROTECTORS

REGULAR PROTECTORS	Number cases	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
J. T. McCORMICK, METROPOLITAN AND LONG ISLAND DIVISION							
Thos. H. Allen	13	$257 85	$31 65	$13 40	$41 34	.....	$86 39
Benj. M. Bailey	6	60 00	2 60	.....	.....	.....	2 60
Fred Bauerschmidt	5	71 50	1 50	.....	.....	.....	1 50
David H. W. Benson	18	373 40	29 30	8 35	17 52	.....	55 17
Edmund Gallagher	24	493 45	27 85	8 95	17 52	.....	54 32
Harry P. Haff	31	602 80	42 20	21 50	5 00	.....	68 70
Edgar Hicks	11	560 00	.....	.....	.....	.....	.....
Herbert A. Horton	20	357 50	23 50	6 10	10 00	.....	39 60
Everett J. Knapp	9	77 80	17 85	.....	.....	.....	17 85
John T. McCormick	15	417 50	6 15	1 95	.....	.....	8 10
E. R. Overton	32	242 50	31 55	.....	32 00	$2 00	65 55
Jos. V. Sauter	1	30 00	.....	.....	.....	.....	.....
D. C. Speenburgh	5	170 00	.....	.....	.....	.....	.....
Geo. E. Sutton	20	223 00	28 00	.....	.....	5 00	33 00
John H. Wackermann	7	76 50	12 25	3 95	23 84	.....	40 04
John J. Ward	1	25 00	.....	.....	.....	.....	.....
Jas. H. Hildreth	.....	.....	.....	.....	.....	.....	.....
Chas. E. Lee	13	97 75	19 65	4 30	30 00	.....	53 95
Total	231	$4,136 55	$274 05	$68 50	$177 22	$7 00	$526 77
W. C. FARLEY, SOUTHERN DIVISION.							
Lewis H. Burnside	13	$210 05	$10 05	.....	.....	.....	$10 05
M. J. Callahan	6	63 75	12 70	.....	$10 00	.....	22 70
Willis D. Cloyes	10	103 25	5 25	.....	.....	.....	5 25
Jos. M. De Silva	30	492 55	21 90	$15 45	.....	.....	37 35
Wm. C. Farley	2	85 50	50	.....	.....	.....	50
Philip S. Farnham	1	27 50	2 50	.....	.....	.....	2 50
Edward C. Gleason	25	601 50	20 70	.....	.....	.....	20 70
R. Hume Grant	10	335 00	5 00	.....	.....	.....	5 00
Dennis E. Keefe	3	51 80	1 80	.....	.....	.....	1 80
Michael C. Murphy	6	84 75	4 75	.....	.....	.....	4 75
A. O. Perkins	22	254 80	35 25	15 66	20 00	.....	70 91
John B. Vann	27	385 45	42 40	1 55	35 00	.....	78 95
O. C. Woolf	20	469 75	23 20	4 15	37 00	.....	64 35
Chas. H. Yaple	23	337 35	21 35	.....	.....	.....	21 35
Total	198	$3,503 00	$207 35	$36 81	$102 00	.....	$346 16
B. A. CAMERON, NORTHERN ADIRONDACK DIVISION							
C. A. Bissell	1	$10 50	$0 50	.....	.....	.....	$0 50
Byron A. Cameron	26	735 15	60 70	$12 80	$15 00	.....	88 50
Irad E. Featherston	6	188 25	10 83	4 85	5 00	.....	20 68
Jas. S. Ford	53	996 75	75 30	21 35	10 00	.....	106 65
Chas. J. Kirby	14	135 75	10 05	.....	.....	.....	10 05
D. E. Moxley	8	183 25	13 60	4 50	.....	.....	18 10
J. H. North	11	142 25	12 25	.....	16 00	.....	28 25
Chas. Riley	16	260 85	24 50	14 35	15 00	.....	53 85
Dan W. Seckington	38	929 35	77 55	47 45	87 18	.....	212 18
Edward St. Clair	4	62 45	5 90	.....	.....	.....	5 90
F. G. Thomas	18	155 00	21 95	.....	.....	.....	21 95
Total	195	$3,799 55	$313 13	$105 30	$148 18	.....	$566 61
F. C. MULLIN, ST. LAWRENCE DIVISION							
Wm. Andre	10	$157 50	$7 50	.....	.....	.....	$7 50
Ray A. Bachman	4	71 75	6 65	$1 10	.....	.....	7 75
J. E. Ball	.....	.....	.....	.....	.....	.....	.....
Wm. G. Bell	28	417 50	17 50	.....	.....	.....	17 50
John Dollinger	3	36 50	1 50	.....	.....	.....	1 50
Jay Hand	13	222 50	14 00	3 50	.....	.....	17 50
Joseph Jenkins	8	102 10	3 10	.....	.....	.....	3 10
J. H. Kane	25	434 95	22 20	.....	$15 00	$7 00	44 20

RECORD OF DIVISIONS, REGULAR PROTECTORS — (*Continued*)

REGULAR PROTECTORS	Number cases	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
F. C. MULLIN, ST. LAWRENCE DIVISION — (*Concluded*)							
Emery Kinsman	2	$25 75	$3 05				$3 05
John H. Mallette	2	20 50	50				50
Frank C. Mullin	15	236 40	9 70	$2 00	$15 80		27 50
Jos. Northrup	8	148 00	7 00				7 00
Jos. T. Smith	4	167 25	9 00	14 55	10 00		33 55
Peter Ver Snyder	3	52 25	2 25				2 25
A. P. Williams	14	253 20	7 00				7 00
Total	139	$2,346 15	$110 95	$21 15	$40 80	$7 00	$179 90
R. B. NICHOLS, EASTERN ADIRONDACK DIVISION							
Wm. H. Burnett	25	$379 45	$42 75				$42 75
Wm. J. Butler	7	140 50	10 00	$2 95	$10 00		22 95
H. B. Cruikshank	24	333 50	112 70	33 55	15 50		161 75
Morgan B. Leland	12	185 00	10 75				10 75
R. B. Nichols	3	88 50	1 50				1 50
W. H. Ronald	5	131 50	13 30	13 20			26 50
J. J. McDonough							
N. A. Scott	5	51 00	4 60				4 60
T. J. Sheridan	9	98 00	15 55	2 00	25 00		42 55
Robert Somerville	6	52 50	7 40	14 50			21 90
R. E. Warren	31	347 00	40 85	12 80	10 00		63 65
Total	127	$1,806 95	$259 40	$79 00	$60 50		$398 90
W. H. WESTON, CENTRAL NEW YORK DIVISION							
F. H. Bellinger	4	$81 75	$1 75				$1 75
Elton B. Downing	14	262 00	21 00				21 00
C. J. Franklin							
F. W. Hamilton	37	725 95	45 75	$0 45	$11 50		57 70
Wm. Herrick	2	34 00	4 00				4 00
Willard A. Hoagland	4	61 50	9 60				9 60
S. S. Taylor	3	79 00	6 75				6 75
Merton Westcott	15	196 05	13 90	3 25			17 15
Wm. H. Weston	5	210 00	10 00				10 00
John Willis	11	465 70	26 85	11 20	62 50		100 55
C. G. Worden	27	452 55	24 90	10 20	5 00	$2 50	42 60
Total	122	$2,568 50	$164 50	$25 10	$79 00	$2 50	$271 10
CHAS. R. STAPLEY, ALLEGANY DIVISION							
Carl A. Beebe	16	$256 50	$12 50				$12 50
Chester C. Culver	15	176 70	24 15	$3 75	$10 00	$2 50	40 40
Henry Heffernan	15	310 40	15 40				15 40
Lewis S. Morris	7	57 05	2 05				2 05
Wallace L. Reed	17	472 95	30 50	8 00			38 50
S. S. Scott	5	68 50	3 50				3 50
Chas. R. Stapley	35	592 60	36 50	2 80			39 30
V. A. Zimmer	3	50 50	4 35	4 20			8 55
Total	113	$1,985 20	$128 95	$18 75	$10 00	$2 50	$160 20
C. T. DOVILLE, Acting, ONTARIO DIVISION							
Chas. A. Bennett	14	$239 20	$37 65	$7 75			$45 40
H. C. DeWolf	9	187 50	16 00			$1 50	17 50
Claude T. DoVille	22	514 30	32 10	8 90		10	41 10
E. H. Gammon	25	605 75	101 70	49 20	$114 90		265 80
Peter Knobloch	9	320 10	30 55	10 25	13 00	95	54 75
Chas. H. O'Donnell	4	175 75	5 75				5 75
Geo. H. Travis	27	488 70	33 20	1 50	40 00		74 70
M. C. Worts	2	50 00			10 00		10 00
Geo. Davis							
Total	112	$2,581 30	$256 95	$77 60	$177 90	$2 55	$515 00

RECORD OF DIVISIONS, REGULAR PROTECTORS — (*Concluded*)

REGULAR PROTECTORS	Number cases	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
F. W. HAMILTON, WESTERN DIVISION							
John W. Broderick	9	$147 00	$14 35	$2 40	$10 00	.....	$26 75
Wm. R. Clark	3	135 00	1 85	3 00	.....	.....	4 85
Edward Geenan	6	107 50	16 45	12 50	20 00	.....	48 95
F. W. Hamilton	12	259 50	26 50	13 00	10 00	.....	49 50
J. F. Hirsch	.....	.....	.....	.....	.....	.....	.....
Wm. C. Hodge	25	446 35	34 95	1 35	10 00	.....	46 30
Ross N. Hudson	.....	.....	.....	.....	.....	.....	.....
Fred Hoffman	8	156 50	21 00	7 50	40 00	.....	68 50
Wm. H. Irons	11	187 70	19 80	8 80	10 00	.....	38 60
Thos. E. Marsh	3	47 85	2 85	.....	.....	.....	2 85
C. J. Miles	.....	.....	.....	.....	.....	.....	.....
Milton S. Smith	8	161 40	15 40	.....	.....	.....	15 40
Total	85	$1,648 80	$153 15	$48 55	$100 00	.....	$301 70
CHAS. E. LEE, HUDSON DIVISION							
Joseph Barry	6	$74 25	$4 25	.....	.....	.....	$4 25
Andrew J. Conklin	6	70 00	3 00	.....	.....	.....	3 00
Eugene C. Cross	11	346 95	11 70	$16 50	.....	.....	28 20
Fred DeWitt	16	342 25	12 25	.....	.....	.....	12 25
Calvin Emerick	11	206 80	12 95	.....	$10 00	.....	22 95
Willett Kidd	6	158 60	20 15	8 25	.....	.....	28 40
Chas. E. Lee	.....	.....	.....	.....	.....	.....	.....
Richard F. Maher	13	153 80	20 40	.....	.....	.....	20 40
B. W. Philbrick	6	96 00	9 75	.....	.....	.....	9 75
Total	75	$1,448 65	$94 45	$24 75	$10 00	.....	$129 20
JOHN E. LEAVITT, SOUTHERN ADIRONDACK DIVISION							
Edward J. Birch	5	$167 75	$2 75	.....	.....	.....	$2 75
Miles Hazelton	9	273 75	11 15	.....	$10 00	.....	21 15
C. M. Hiller	7	69 10	4 10	.....	.....	.....	4 10
C. H. Masten	4	92 60	2 60	.....	.....	.....	2 60
Wm. F. Newell	23	429 00	23 65	$14 40	11 70	$2 00	51 75
C. E. Underhill	2	21 00	1 00	.....	.....	.....	1 00
Cleveland Wheaton	9	732 02	4 00	.....	.....	.....	4 00
Total	59	$1,785 22	$49 25	$14 40	$21 70	$2 00	$87 35
C. A. JOHNSTON, EASTERN DIVISION							
Patrick F. Butler	4	$112 90	$7 99	.....	.....	.....	$7 99
Z. T. Cater	17	313 45	43 00	.....	$14 00	.....	57 00
Jas. A. Colloton	21	332 00	11 15	$13 75	.....	.....	24 90
Albert E. Davis	3	31 50	1 50	.....	.....	.....	1 50
Wm. L. Delaney	1	.....	9 30	22 25	30 00	.....	61 55
Jacob A. Ginder	9	314 50	19 45	8 80	.....	.....	28 25
C. A. Johnston	4	45 00	71 25	.....	.....	.....	71 25
F. Vandeboe	.....	.....	.....	.....	.....	.....	.....
Total	59	$1,149 35	$163 64	$44 80	$44 00	.....	$252 44

RECORD OF DIVISIONS, SPECIAL PROTECTORS

SPECIAL PROTECTORS	Number cases	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
J. T. McCORMICK, METROPOLITAN AND LONG ISLAND DIVISION							
Fred Bradley	3	$73 50	$6 90	$1 00			$7 90
James Graham	2	120 00					
J. R. Hegeman, Jr.	1	80 00			$23 50		23 50
Total	6	$273 50	$6 90	$1 00	$23 50		$31 40
W. C. FARLEY, SOUTHERN DIVISION							
Fred E. Coats	1	$15 00	$1 75				$1 75
S. M. Perry	1	25 00	1 25		$2 00		3 25
Total	2	$40 00	$3 00		$2 00		$5 00
B. A. CAMERON, NORTHERN ADIRONDACK DIVISION							
Howard Davidson	2	$36 50	$4 50		$10 00		$14 50
W. M. Stearns	13	276 25	23 70	$2 55			26 25
Total	15	$312 75	$28 20	$2 55	$10 00		$40 75
F. C. MULLIN, ST. LAWRENCE DIVISION							
E. Chamberlain	1	$22 00	$3 00	$4 00			$7 00
A. Eels	1	25 85	85				85
F. E. Johnson	1	30 50	50				50
Fred E. Pitts	5	107 00	8 50	3 55	$8 00		20 05
W. S. Rutherford	6	171 90	6 50	9 50			16 00
Total	14	$357 25	$19 35	$17 05	$8 00		$44 40
R. B. NICHOLS, EASTERN ADIRONDACK DIVISION							
B. T. Burnett	1	$16 00	$1 00				$1 00
E. R. Fish	1	26 00	1 00				1 00
F. H. Kemp	3	35 00	5 50				5 50
A. S. Temple	5	111 00	8 35	$28 20	$17 50		54 05
Total	10	$188 00	$15 85	$28 20	$17 50		$61 55
W. H. WESTON, CENTRAL NEW YORK DIVISION							
B. J. Anson	19	$492 50	$52 20	$27 80	$47 40	$21 10	$148 50
Geo. Brier	7	79 25	8 25				8 25
W. H. Bundenthal	14	311 00	24 00	2 00			26 00
B. Everingham	9	208 00	14 00	4 00			18 00
W. R. Floyd	3	62 25	7 95				7 95
W. A. Hoagland	3	103 65	8 75	4 90			13 65
John D. Black	2	79 00	4 00				4 00
Total	57	$1,335 65	$119 15	$38 70	$47 40	$21 10	$226 35
CHARLES R. STAFLEY, ALLEGANY DIVISION							
F. E. Blossom	1	$21 00	$1 00		$5 00		$6 00
A. J. Clark	2	51 50	1 50				1 50
J. T. Concannon	1	26 00	1 00				1 00
F. J. Maloney	6	66 50	7 25				7 25
Total	10	$165 00	$10 75		$5 00		$15 75
F. W. HAMILTON, WESTERN DIVISION							
C. Gould	3	$38 75	$8 75			$0 20	$8 95
R. L. Moore	2	20 00	4 50				4 50
A. J. Roberts	1	26 50	1 50				1 50
A. Stadlmeir	5	96 70	6 70				6 70
R. S. Suor	6	46 00	6 00				6 00
Henry Wilcox	8	102 00	17 00				17 00
Total	25	$329 95	$44 45			$0 20	$44 65

RECORD OF DIVISIONS, SPECIAL PROTECTOR — (*Concluded*)

SPECIAL PROTECTORS	No. cases	Recovery	Court costs	Constable fees	Attorneys' fees	Other charges	Total costs
C. T. DEVILLE, ACTING DIVISION CHIEF, ONTARIO DIVISION							
L. Bardo	5	$86 40	$17 45	$20 15			$37 60
A. DuBois	1	16 60	1 60				1 60
F. Houston	2	38 00	1 50	1 50			3 00
H. L. Jennings	1	50 00	1 95				1 95
F. T. Schmidt	10	410 00	38 05	11 10	$30 00	$0 72	79 87
F. A. Weichbrodt	2	18 00	6 00				6 00
L. S. Wood	1	108 00	3 00				3 00
Total	22	$727 00	$69 55	$32 75	$30 00	$0 72	$133 02
CHAS. E. LEE, HUDSON DIVISION							
A. C. Frederick	1	$10 00	$2 00				$2 00
L. H. Weed	3	65 00	4 00				4 00
Total	4	$75 00	$6 00				$6 00
JOHN E. LEAVITT, SOUTHERN ADIRONDACK DIVISION							
H. J. Clifford	3						
A. Cooper	1	$10 00			$2 00		$2 00
E. W. Gauding	3	32 75	$2 75				2 75
C. H. Masten	1	50 75	75				75
Jos. E. Moak	1		4 50	$8 05			12 55
Total	9	$93 50	$8 00	$8 05	$2 00		$18 05
C. A. JOHNSTON, EASTERN DIVISION							
H. T. Ashton	1	$17 45	$1 70				$1 70
P. F. Butler	1	76 00					
Henry Con	1	10 00					
W. H. Jackson	2	40 00					
F. P. Viele	1	13 00	3 00				3 00
Total	6	$156 45	$4 70				$4 70

HUNTING LICENSES ISSUED DURING THE FISCAL YEAR

(October 1, 1911 to September 30, 1912.)

COUNTY	Resident	Non-resident	Non-resident tax payer	Total
Albany	2,370	80	.....	2,450
Allegany	2,716	20	10	2,746
Broome	2,733	20	10	2,763
Cattaraugus	2,789	60	10	2,859
Cayuga	2,664	40	.....	2,704
Chautauqua	3,245	20	.....	3,265
Chemung	1,869	.....	.....	1,869
Chenango	2,692	.....	10	2,702
Clinton	1,674	.....	10	1,684
Columbia	1,896	.....	.....	1,896
Cortland	1,225	.....	.....	1,225
Delaware	2,672	20	.....	2,692
Dutchess	2,766	20	.....	2,786
Erie	4,399	40	10	4,449
Essex	3,131	160	30	3,321
Franklin	3,259	420	50	3,729
Fulton	1,798	20	.....	1,818
Genesee	1,638	20	.....	1,658
Greene	1,996	20	.....	2,016
Hamilton	1,119	440	60	1,619
Herkimer	2,182	80	10	2,272
Jefferson	3,827	20	10	3,857
Kings	1,815	60	.....	1,875
Lewis	1,835	60	.....	1,895
Livingston	2,218	.....	.....	2,218
Madison	1,742	.....	.....	1,742
Monroe	5,583	80	.....	5,663
Montgomery	1,491	.....	.....	1,491
Nassau	2,311	20	.....	2,331
New York	3,533	620	100	4,253
Niagara	1,953	.....	.....	1,953
Oneida	3,740	120	20	3,880
Onondaga	4,677	.....	20	4,697
Ontario	2,709	.....	.....	2,709
Orange	3,812	.....	.....	3,812
Orleans	1,143	.....	.....	1,143
Oswego	2,853	20	.....	2,873
Otsego	2,235	.....	.....	2,235
Putnam	514	40	.....	554
Queens	1,070	.....	.....	1,070
Rensselaer	2,099	60	.....	2,159
Richmond	455	.....	.....	455
Rockland	1,308	20	.....	1,328
St. Lawrence	4,340	160	20	4,520
Saratoga	2,612	.....	.....	2,612
Schenectady	1,780	.....	.....	1,780
Schoharie	1,342	.....	.....	1,342
Schuyler	684	.....	.....	684
Seneca	895	20	.....	915
Steuben	4,090	40	.....	4,130
Suffolk	5,545	320	30	5,895
Sullivan	2,342	20	.....	2,362
Tioga	1,706	.....	.....	1,706
Tompkins	1,563	.....	10	1,573
Ulster	3,729	60	.....	3,789
Warren	2,219	60	20	2,299
Washington	1,965	20	20	2,005
Wayne	3,690	20	.....	3,710
Westchester	2,988	60	40	3,088
Wyoming	1,199	.....	.....	1,199
Yates	1,303	.....	.....	1,303
	147,748	3,380	500	151,628

Licensed Nets Used and Fees Paid, October 1, 1911, to September 30, 1912

	Fykes	Scap and drop	Gill	Seines	Stake	Machine trap	Row, sail or power boat	Trap	
Hudson river, Delaware river, Rondout creek	728	299	173	93	30	.....	.....	.....	$3,323 27
Lake Ontario	.....	.....	.....	.....	.....	.....	53	2	946 83
Lake Erie	.....	.....	.....	.....	.....	.....	32	12	1,263 00
Chaumont Bay	136	1	29	3	.....	.....	.....	144	1,536 00
Cayuga Lake	.....	.....	2	.....	.....	.....	.....	.....	50 00
Otsego Lake	.....	.....	7	.....	.....	.....	.....	.....	145 00
Niagara river	.....	.....	.....	.....	.....	9	.....	.....	180 00
Nets for taking deleterious fish	5	13	.....	17	.....	.....	.....	33	1,141 55
Special permits, no fee	20	.....	.....	3	.....	.....	.....	.....	.....
Minnow net licenses, 213									559 10
Sturgeon set line licenses, 176									200 00
Eel weirs, 12									225 00
Eel pots, 33									33 00
									$9,602 75

Summary of Receipts.

Hunting licenses	$151,628 00
Fines and penalties	32,812 27
Tagging of game	19,614 10
Net licenses	9,602 75
Trout tags	1,079 64
Trout tagging machines	400 00
Sale of hay (State game farm)	330 98
Breeders' licenses (deer, etc.)	215 00
Sale of special protectors' badges	32 00
Bird certificates	31 00
Skunk licenses	10 00
Sale of skins (muskrat)	4 18
Total	$215,759 92

THE ANNUAL KILL OF DEER IN THE ADIRONDACKS.

THE ANNUAL KILL OF DEER IN THE ADIRONDACKS.

For convenience of those who have kept statistics of the annual kill of deer in the Adirondacks there is reproduced herewith, from the annual report of the Forest, Fish and Game Commission for the year 1909, a ten-year table thereof, (1900–1909), as follows:

Year.	Carcases.	Saddles.	Heads.
1900	1,020	89	95
1901	1,062	103	121
1902	1,354	113	193
1903	1,961	145	188
1904	1,618	124	152
1905	2,196	108	180
1906	2,413	108	102
1907	2,021	72	70
1908	1,986	103	85
1909 *	2,810	51	164

To the above is appended the following:

1910	2,148	53	135
1911	1,743	60	114
1912	968	41	120

SEASON OF 1912 SHIPMENTS.

Statistics of shipments of deer from points in the Adirondack regions have been supplied by John L. Van Valkenburgh, superin-

*Of these, 614 carcases, 2 saddles, 24 heads were shipped out between November 1 and 15 the additional season for bucks only.

tendent of the American Express Co., and C. S. Colvin, superintendent of the National Express Co., as follows:

SHIPMENTS OF DEER FROM POINTS IN THE ADIRONDACK REGION.

Mohawk and Malone Route.

Station.	Carcases.	Saddles.	Heads.
Beaver River	32	1	4
Big Moose	22	..	2
Brandeth Lake	2	1	1
Carter	34	2	..
Childwold	15	1	..
Forestport	24	..	..
Floodwood	9	..	..
Fulton Chain	26	..	..
Gabriels	7	..	2
Hinckley	7	..	..
Horseshoe	1	..	..
Lake Clear Junction	9	..	..
Lake Kushaqua	1	..	..
Lake Placid	2	..	..
Little Rapids	1	..	..
Long Lake West	37	5	..
Loon Lake	7	1	..
McKeever	6	..	1
Minnehaha	3	..	..
Mountain View	6	..	1
Nehasane	3	..	8
Onchiote	2	..	..
Otter Lake	2	..	..
Owls Head	..	..	2
Piercefield	45	..	..
Pleasant Lake	10	..	..
Poland	6	..	..
Prospect	21	..	..
Raquette Lake	6	..	..

Mohawk and Malone Route — (Concluded)

Station.	Carcases.	Saddles.	Heads.
Saranac Inn	6	..	1
Saranac Lake	6	..	..
Tupper Lake Junction	61	..	..
White Lake Corners	14	..	..
Woods Lake	3	..	..
	436	11	22

F., J. & G. Route.

Station.	Carcases.	Saddles.	Heads.
Gloversville	8	..	..
Northville	88	..	5
	96	..	5

N. Y. & O. Route.

Station.	Carcases.	Saddles.	Heads.
Bay Pond	1	..	..
Brandon	3	..	..
Childwold	3	..	..
Derrick	12	..	..
Kildare	8	..	..
Madawaska	8	..	..
Meno	14	..	..
Moira	1	..	..
Santa Clara	17	..	2
Spring Cove	6	..	..
St. Regis Falls	5	..	5
	78	..	7

R., W. & O. Route (C. & A. Branch.)

Station.	Carcases.	Saddles.	Heads.
Aldrich	2	..	..
Benson Mines	22	3	..
Harrisville	11	..	..
Kalurah	4	..	..
Natural Bridge	1	..	..
Newton Falls	46	4	..
Oswegatchie	10	..	..
Wanakena	29	18	7
	125	25	7

R., W. & O. Route.

Station.	Carcases.	Saddles.	Heads.
Canton	4	1	..
De Kalb Junction	7	..	..
Edwards	1	..	..
Hermon	1	..	..
Massena	..	..	3
Potsdam	18	1	..
Rensselaer Falls	1	..	..
	32	2	3

Little Falls & Dolgeville Route.

Station.	Carcases.	Saddles.	Heads.
Dolgeville	3	..	2
Salisbury Center	7	..	2
	10	..	4

R., W. & O. Route, (U. & B. R.)

Station.	Carcases.	Saddles.	Heads.
Alder Creek	5	..	..
Boonville	1	..	..
Carthage	1	..	..
Croghan	7	..	..
Glenfield	5	..	..
Lowville	4	..	..
Lyons Falls	4	..	..
Ogdensburg	1	..	..
Prospect	2	..	..
	30		

Delaware & Hudson R. R.

Station.	Carcases.	Saddles.	Heads.
Ausable, N. Y.	..	..	7
Bloomingdale, N. Y.	2	1	2
Corinth, N. Y.	1	..	3
Crown Point, N. Y.	..	..	3
Dannemora, N. Y.	..	..	2
Glens Falls, N. Y.	..	..	3
Hadley, N. Y.	1	..	3
Keeseville, N. Y.	1	..	3
Loon Lake, N. Y.	2	..	2
Morrisonville, N. Y.	..	..	1
No. Creek, N. Y.	108	..	3
Plattsburgh, N. Y.	..	..	2
Peru, N. Y.	..	..	1
Port Henry, N. Y.	8	1	17
Riverside, N. Y.	4	..	2
Russia, N. Y.	1	..	1
Saratoga Springs, N. Y.	1	..	1
Stony Creek, N. Y.	26	..	..
The Glen, N. Y.	1	..	1
Thurman, N. Y.	..	1	2

Station.	Carcases.	Saddles.	Heads.
Warrensburgh, N. Y.	..	..	4
Westport, N. Y.	3	..	9
Ticonderoga, N. Y.	2	..	..
	161	3	72

Recapitulation.

Stations.	Carcases.	Saddles.	Heads.
M. & M. Rte.	436	11	22
F., J. & G. Rte.	96	..	5
N. Y. & O. Rte.	78	..	7
R., W. & O. (C. & A. Br.)	125	25	7
R., W. & O. Rte.	32	2	3
L. F. & D. Rte.	10	..	4
R., W. & O. (U. & B. R.)	30	..	..
	807	38	48
D. & H. R. R.	161	3	72
	968	41	120

SHIPMENTS OF DEER WEIGHING 200 POUNDS OR OVER.

Shipping station	Consignee	Destination	Dressed weight
Alder Creek	W. A. Sayer	Stittville	211
Croghan, N. Y.	J. Evens	Syracuse	201
De Kalb Jct	O. Wolf	Ogdensburg	203
Gabriels	G. D. Corlin	Winthrop	200
Harrisville	J. D. Shanman	New York City	240
Kildare	J. D. Corwin	New York City	200
Lake Kushaqua	M. T. Conklin	Elmira	200
Loon Lake	J. Gremer	Gabriels	200
Oswegatchie	W. Kelly	Syracuse	201
Saranac Lake	F. Nies	Buffalo	200
White Lake Corners	C. Stevens	Wilseyville, N. Y.	207
Carter, N. Y.	H. H. Boomes	Syracuse	225
Long Lake West	P. Squires	Saranac Lake	200
Newton Falls	A. J. Fix	Batavia	205
Northville	M. J. Sandtfult	Gloversville	200
Northville	C. Weaver	Corning	200
Santa Clara	G. H. Beck	Brooklyn	209
Tupper Lake Jct	B. J. Donovan	New York	240
Tupper Lake Jct	J. S. Neet	Syracuse	220
Derrick	A. J. Slone	Syracuse	200
Floodwood	J. Collinn	Saranac Lake	200
Floodwood	J. C. Finch	Albany	200
Kalurah	F. J. Wilbur	Harrisville	200
Madawaska	H. Baler	Lake Pleasant	200
Meno	A. Scinton	Madrid	200
Onchiote	W. Heraman	Congers	200
Otter Lake	W. C. Granger	Charlotte, N. Y.	200
Hadley	A. McBride	Brooklyn	200
North Creek	Austin Mills	Troy	221
North Creek	P. R. St. John	Binghamton	208
Riverside	T. Kennedy	New York	220
Stony Creek	Geo. Blessing	Ballston Spa	220
Stony Creek	A. L. Frederick	Albany	200
Stony Creek	Wm. Whalen	Ballston Spa	206
Ticonderoga	H. Halstead	Hornell	215
Phoenicia	John Gotelli	Rondout	300

HUNTING ACCIDENTS.

Exceptional interest has been manifested in the matter of hunting accidents incident to the deer season of 1912. The enactment of the so-called Buck Law had as its chief purpose, the safeguarding of human life by requiring the hunter to be more careful what he shot at. The results are considered to have vindicated the new law. The Commission directed its protective force to make careful and unbiased investigations and report the facts as found. Here are the reports:

No hunting accidents in any of the five counties of the Eastern Division.

CASSIUS A. JOHNSTON,
Division Chief.

There was not a person shot by being mistaken for a deer during the past season in my division.

BYRON A. CAMERON,
Division Chief.

No record of persons being fatally wounded by being mistaken for deer, in the Northern Division.

WILLIAM C. FARLEY,
Division Chief.

I took the matter up with the protectors in this division and none of them knew of a single accident that occurred in hunting deer this season. I took the matter up with them separately and questioned them closely and found the situation to be as above stated. I also made other inquiries in different localities in this division and found the same result, and I do not think it possible to find an accident while hunting deer during the season just closed within this division.

J. E. LEAVITT,
Division Chief.

As far as any of us can ascertain there have been absolutely no cases of hunting accidents in this territory while hunting for deer. All the men in this division were in the deer territory practically the whole of the open season for deer. They have since covered the whole territory very thoroughly and have caused inquiries to be made in regard to the subject. As far as I am able to learn there has not been a single fatality in this division resulting from a hunting accident this season.

CHARLES E. LEE,
Division Chief.

Only one accident in this division. On October 25, 1912, Clint Mattison was mistaken for a deer and shot by Harry

Palmer. The accident occurred two and one-half miles from Alder Bed lumber camp in Herkimer county. Mattison received a rifle ball through each of his legs, caused by two separate shots, and each took effect above the knees, causing flesh wounds. Mattison was taken to the hospital at Watertown and was discharged two weeks later and is not much the worse for his experience.

F. C. MULLIN,
Division Chief.

I have taken the matter up with all of my men and they do not know of a single case where a person has been mistaken for a deer or shot while hunting deer this year.

CHAS. R. STAPLEY,
Division Chief.

I took the matter up at my block meeting when all regular protectors were present, and ten specials, and no one knew of any except the Mr. Moore accident, and as he was from Lockport, I gave the matter to Protector Irons to investigate, and this is his report: "In regard to Mr. Moore, the man who got shot, would say that his gun was accidently discharged while he was in the Adirondack mountains, and that he was not mistaken for a deer."

F. W. HAMILTON,
Division Chief.

Protectors all report that they have not heard of any accidents. As you know, there is no deer hunting in my division.

JOHN T. McCORMICK,
Division Chief.

Protectors inform me that there has not been one shooting accident where a person was taken for a deer and shot in Hamilton,

Warren, Saratoga or Washington counties, or where anyone was taken for any kind of game and shot.

R. B. NICHOLS,
Division Chief.

To my personal knowledge and from diligent inquiries I feel safe in saying that no hunter from this county was shot in mistake for a deer during the season of 1912.

WM. H. WESTON,
Division Chief.

ANNUAL REPORT

OF THE

BUREAU OF MARINE FISHERIES.

[179]

ANNUAL REPORT

OF THE

SUPERINTENDENT OF MARINE FISHERIES.

Hon. Thomas H. Guy, *Deputy Conservation Commissioner:*

Complying with requirement contained in section 303, part 10 of chapter 318, known as the Conservation Law, I hereby transmit report of the Bureau of Marine Fisheries for the fiscal year ending September 30, 1912. It would seem advisable that provision be made for preservation of signals in order that prompt and reliable locations may be made. It might be well at this time to refer to the advantages which would accrue to the intelligent administration of the State's oyster properties if the lands were mapped in plots and records made comprehensively describing each plot. Though the initial expense might be considerable, I believe it would be for the interest of economy in the long run, as such records would enable this branch of the State's service to obtain a fairly accurate estimate of areas available for shellfish cultivation and of their value for this purpose. It is a rule of this Bureau that all lands applied for be thoroughly examined and reported upon before action is taken to lease the same in order that the section of law prohibiting the leasing of grounds naturally productive is fully observed. The plotting and report of conditions above mentioned would not eliminate the necessity for further examination when application is made, but would be of great assistance in systematizing the State's shell-fish business and would also stimulate competition when selling leases for lands which heretofore have been subject to tacit understanding that the applicant be considered somewhat in the nature of discoverer and therefore entitled to preference. This condition would not exist if the oyster growers and the State had data to refer to without making necessary individual exploration. If it should be decided to do this work, a suitable vessel with proper equipment would be required.

This Bureau has had several conferences with the leading oyster growers of the State for the purpose of ascertaining their

views in the matter of improving conditions in this branch of the State's industries, with the object of bringing about a better understanding of what would be best to stimulate this line of business to the end that greater production of this natural wealth be attained and relations mutually beneficial to the oyster growers and the State be achieved. In addition to these meetings many communications making inquiry along these lines were sent out and numerous replies received. These oyster growers are practically unanimous in expressing their opinion that untried grounds, which have no natural growth, should be leased for a short term of years at a nominal figure for experimental purposes and that a basis of fixed rental be arrived at in case the ground should prove susceptible of cultivation, and in case it should not so prove, to revert back to the State on expiration of the short lease. I believe there is much that can be said in favor of this or some similar plan which will encourage the development of untried lands which do not appeal to growers as worth while risking the usual rental, cost of cleaning and planting, with natural conditions apparently unfavorable. Some plan of classification would no doubt have to be adopted in order that a price which would be fair to the State and oyster producers be arrived at. The plotting and examination previously referred to would assist in determining values. The State would eventually gain a material increase of revenue from its oyster properties by success in development of many of these untried areas, most of which will probably lie dormant indefinitely, while if experiment is successful, additional food product and wealth is created. A contributory benefit incident to having as much land as possible under cultivation is the carrying by the tides of spawn to nearby localities, thereby creating natural beds where none now exist, this being made probable by reason of the oyster's natural way of reproducing itself.

The sanitary inspection of shellfish grounds was discussed at the meetings referred to, and the general opinion was expressed that this section of the Conservation Law should have means for enforcement and apply to all shell-fish grounds. An efficient system of examination, administered in such a way that all oysters marketed bear the official seal for wholesomeness and

purity would do much to have this important and valuable food product receive general confidence, thereby creating greater demand and increase in this line of business. The ceding by the State of lands under water in Jamaica Bay to Greater New York, to be used for extension of harbor and dock facilities, will deprive the State of considerable revenue heretofore derived from this important oyster growing section, but no doubt this will lead to development by oyster growers in waters of other sections, such as Long Island Sound, Raritan Bay, Hudson river, etc.

I append condensed summaries of the various records of the Bureau of Marine Fisheries, all of which are accurate and, I believe, comprehensive, each under the titles as recorded; also a full list of all existing franchises and leases, each lot showing in detail all matter connected therewith in itemized form.

All of which is respectfully submitted.

Yours very respectfully,

EDWIN BAILEY,
Supervisor.

Dated, New York, December 31, 1912.

GROUNDS APPLIED FOR AND GRANTED.

During the fiscal year there were applied for and granted:

	Acres.
Raritan bay	512.4
Long Island sound	262
East Chester bay	5.6
	780

No.	Name and location.	Acres.
1868	Wm. H. Morris, East Chester bay	2.6
1922	Chas. H. Zorn, East Chester bay	3
1877	F. F. Downs, Long Island sound	137
1878	F. F. Downs, Long Island sound	125
1876	Thos. Hassett, Jr., Raritan bay	200
1916	Geo. Marshall, Raritan bay	5
1917	Christian Walle, Raritan bay	4
1921	New York Oyster Co., Raritan bay	63.4
1925	John I. Merrell, Raritan bay	50
1926	Frazer & Houghwout, Raritan bay	30
1927	Frazer & Houghwout, Raritan bay	10
1928	Alex Frazer Co., Raritan bay	150
		780

GROUNDS APPLIED FOR AND CANCELLED AND DEPOSIT RETURNED

	Acres.
Raritan bay	695
Long Island sound	185
Hudson river	100
Hempstead harbor	10
East Chester bay	2
	992

GROUNDS APPLIED FOR AND CANCELLED AND 25 PER CENT. DEPOSIT RETURNED.

App. No.	Name and location.	Acres.
1867	W. H. Morris, East Chester bay	2
1869	A. F. Skinner, Hudson river	100
1870	C. S. Mott, Raritan bay	200
1871	C. S. Mott, Raritan bay	200
1872	J. I. Merrell, Raritan bay	50
1873	C. H. Merrell, Raritan bay	50
1874	J. S. Hoag, Raritan bay	10
1875	A. F. Merrell, Lond Island sound	135
1879	Otto D. Housman, Lond Island sound	50
1884	Samuel Thorn, Hempstead harbor	10
1915	Thomas Hassett, Raritan bay	150
1919	J. E. Still, Raritan bay	35
		992

GROUND APPLIED FOR AND NOT SOLD, DECLARED NATURAL GROUND, DEPOSIT RETURNED.

App. No.	Name and location.	Acres.
1901	Christian Walle, Staten Island sound	10
1902	Geo. T. Androvette, Staten Island sound	30
1904	Azel F. Merrell, Staten Island sound	20
1905	Merrell & Burbank, Staten Island sound	12
1906	New York Oyster Co., Staten Island sound	30
1909	Lyman W. Bedell, Staten Island sound	12
		114

GROUNDS APPLIED FOR AND SOLD, BUT LEASES NOT AS YET GRANTED DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1912.

App. No.	Name and location.	Acres.
1880	George Marshall, Staten Island sound	10
1881	George Marshall, Staten Island sound	12
1882	R. W. LaForge, Staten Island sound	5
1883	John I. Merrell, Staten Island sound	10

App. No.	Name and location.	Acres.
1885	H. I. Merrell, Staten Island sound.....	10
1886	Chas. H. Merrell, Staten Island sound.....	10
1887	Chas. H. Merrell, Staten Island sound.....	10
1888	Christian Walle, Staten Island sound.....	10
1889	Androvette & Thompson, Staten Island sound..	10
1890	Androvette & Thompson, Staten Island sound..	10
1891	R. W. LaForge, Staten Island sound.....	5
1892	John I. Merrell, Staten Island sound.....	10
1893	Henry Marshall, Staten Island sound.....	10
1894	Merrell & Burbank, Staten Island sound.....	10
1895	Azel F. Merrell, Staten Island sound.....	10
1896	Azel F. Merrell, Staten Island sound.....	10
1897	Wm. C. Porth, Staten Island sound.....	10
1898	New York Oyster Co., Staten Island sound....	10
1899	New York Oyster Co., Staten Island sound....	10
1900	New York Oyster Co., Staten Island sound....	12
1906	New York Oyster Co., Staten Island sound....	30
1907	Peter Polworth, Staten Island sound.....	30
1908	Fletcher Decker, Staten Island sound.....	10
1910	Lyman W. Bedell, Staten Island sound.....	6
1911	Lyman W. Bedell, Staten Island sound.....	6
1912	Benj. H. Lang, Saten Island sound.....	11
1913	Benj. H. Lang, Staten Island sound.....	7
1914	Benj. H. Lang, Staten Island sound.....	6
1920	W. W. LaForge, Staten Island sound.....	10
1923	August G. Miller, East Chester bay.....	2
		312

GROUNDS APPLIED FOR AND NOT SOLD.

No.	Name and location.	Acres.
1918	Henry S. Marshall, Raritan bay.....	2
1924	W. W. LaForge, Hudson river.....	10
1930	J. E. Still, Raritan bay.....	50
1929	Alex. Frazer Co., Raritan bay.....	150
		212

LEASES SURRENDERED TO THE STATE.

Richmond County.

No.	Name.	Acres.
937	John Journeay	2.4

Long Island Sound.

No.	Name.	Acres.
Sev.	W. J. Mills	115
Sev.	W. J. Mills	75
Sev.	F. F. Downs	135
Sev.	F. F. Downs	25
		350

East Chester Bay

No.	Name.	Acres.
309	F. C. Glasier	6.2
257	Robert Lee	15.6
		21.8

Jamaica Bay.

No.	Name.	Acres.
626	N. E. Davis	1.2
625	N. E. Davis	3.2
516	H. C. Quaritius	2.4
514	H. C. Quaritius	9.8
436	John R. Vail	12
249	Henry Schumacker	7
		35.6

FRANCHISES SURRENDERED TO THE STATE.

Richmond County.

No.	Name.	Acres.
544	Willian Manee, Sr.	2.1
536	William Manee, Sr.	1.7

No.	Name.	Acres.
547	George T. Androvette	1.7
563	W. S. Androvette	2.5
551	W. S. Androvette	3.5
553	W. S. Androvette	1.8
324	David Joline	5
837	S. C. & D. A. Joline	22.6
306	David Joline	9.9
302	D. A. Joline	4.3
611	S. C. Joline	1.85
116	S. C. Joline	1.85
418	W. N. Manee	4.3
420	W. N. Manee	3.3
140B	C. B. Price	3.3
136	Samuel DeHart	4.5
77	W. N. Manee	2
89	W. N. Manee	.7
		76.6

LEASES SURRENDERED TO THE STATE.

	Acres.
East Chester bay	21.8
Long Island sound	350
Raritan bay	2.4
Jamaica bay	35.6
	409.8

FRANCHISES SURRENDERED TO THE STATE.

	Acres.
Raritan bay	76.6

ANNUAL STATEMENT OF RECEIPTS FOR BUREAU OF MARINE FISHERIES.

DATE	Rentals	Tax	Penalty	Interest	License fees	Recording
1911						
October	$3,763 01	.....	.....	.....	$15 00	$13 50
November	2,378 23	.....	.....	.....	.....	16 00
December	2,673 12	.....	.....	.....	.....	.....
1912						
January	753 86	.....	.....	.....	30 00	8 75
February	457 80	$3,725 62	$90 93	.....	.....	6 25
March	1,118 04	3,121 19	71 80	.....	100 00	11 25
April	174 67	480 53	3 63	$0 12	245 00	8 00
May	649 73	146 74	7 46	2 02	580 00	5 00
June	15 63	.....	.....	.....	325 00	4 25
July	964 17	11 75	2 35	82	390 00	3 50
August	481 77	232 54	41 44	17 14	150 00	11 25
September	724 27	9 15	1 83	65	1,105 00	5 00
Total	$14,154 30	$7,727 52	$219 44	$20 75	$2,940 00	$92 75

TOTAL RECEIPTS FOR THE YEAR PER MONTH.

October	$3,791 51
November	2,394 23
December	2,673 12
January	792 61
February	4,280 60
March	4,422 28
April	911 95
May	1,390 95
June	344 88
July	1,372 59
August	934 14
September	1,845 90
	$25,154 76

RECAPITULATION OF RECEIPTS

Rent	$14,154 30
Tax	7,727 52
Licenses	2,940 00
Recording	92 75
Interest	20 75
Penalty	219 44
	$25,154 76

FRANCHISES

NAME	Lot	Location	Acres	Granted	Tax
Herbert Androvette	178	Raritan Bay	2.4	Oct. 11, 1887	$0 60
Winant S. Androvette	565	Raritan Bay	2.5	Dec. 1, 1889	62
Winant S. Androvette	551	Raritan Bay	3.5	Dec. 1, 1889	89
Winant S. Androvette	561	Raritan Bay	1.8	May 31, 1888	45
Winant S. Androvette	563	Raritan Bay	2.5	Feb. 6, 1888	62
Winant S. Androvette	549	Raritan Bay	2.6	Jan. 31, 1888	65
Winant S. Androvette	622	Raritan Bay	16.9	Mar. 7, 1888	4 23
George T. Androvette	547	Raritan Bay	1.7	June 29, 1888	42
A. W. Androvette	449	Raritan Bay	2.4	Feb. 18, 1888	60
Andrew Anderson	424	Raritan Bay	2.8	Oct. 20, 1887	70
Androvette & Thompson	392	Raritan Bay	11.0	Oct. 11, 1887	2 75
Androvette & Thompson	148	Raritan Bay	3.6	Nov. 3, 1887	90
Androvette & Thompson	339	Raritan Bay	8.3	Nov. 9, 1887	2 07
Androvette & Thompson	337	Raritan Bay	4.0	Nov. 9, 1887	1 00
Androvette & Thompson	568	Raritan Bay	2.1	Feb. 18, 1888	53
Androvette & Thompson	236	Raritan Bay	31.9	June 27, 1890	7 98
Androvette & Thompson	570	Raritan Bay	2.6	Feb. 17, 1888	65
Androvette & Thompson	789	Raritan Bay	10.2	Jan. 31, 1888	2 55
Androvette & Thompson	807	Raritan Bay	2.6	May 26, 1888	65
N. S. Ackerly & Son Company	85	Long Island Sound	51.2	May 3, 1899	12 80
N. S. Ackerly & Son Company	87	Long Island Sound	60.6	May 3, 1899	15 15
N. S. Ackerly & Son Company	86	Long Island Sound	109.2	May 3, 1899	27 30
N. S. Ackerly & Son Company	Several	Long Island Sound	16.2	Mar. 27, 1900	4 05
N. S. Ackerly & Son Company	Several	Long Island Sound	88.9	Sept. 4, 1888	22 23
N. S. Ackerly & Son Company	Several	Long Island Sound	30.0	Dec. 11, 1888	7 50
N. S. Ackerly & Son Company	Several	Long Island Sound	30.0	Mar. 18, 1891	7 50
N. S. Ackerly & Son Company	Several	Long Island Sound	40.0	Jan. 27, 1891	10 00
N. S. Ackerly & Son Company	Several	Long Island Sound	40.0	Dec. 11, 1888	10 00
N. S. Ackerly & Son Company	16	Long Island Sound	21.0	Oct. 28, 1887	5 25
N. S. Ackerly & Son Company	480	Long Island Sound	4.6	Nov. 9, 1887	1 15
N. S. Ackerly	14	Long Island Sound	172.2	Oct. 28, 1887	43 05
N. S. Ackerly	Several	Long Island Sound	60.0	Jan. 12, 1889	15 00
S. Leroy Ackerly	C	Long Island Sound	46.8	Feb. 10, 1891	11 70
S. Leroy Ackerly	Several	Long Island Sound	130.0	Mar. 18, 1891	32 50
H. Davis Ackerly	16	Long Island Sgund	56.0	Oct. 28, 1887	14 00
H. David Ackerly	17	Long Island Sound	193 6	Nov. 7, 1887	48 40
Elmer T. Butler	78	Raritan Bay	27.2	Feb. 17, 1888	6 80
Elmer T. Butler	31	Raritan Bay	.6	May 28, 1888	15
Elmer T. Butler	392	Raritan Bay	20.5	Oct. 11, 1887	5 13

Elmer T. Butler	553	Raritan Bay	2.3	June 29, 1888	57
Elmer T. Butler	388	Raritan Bay	2.4	Oct. 3, 1887	60
Elmer T. Butler	283	Raritan Bay	2.2	Jan. 2, 1889	55
Elmer T. Butler	871	Raritan Bay	2.6	May 20, 1892	65
Elmer T. Butler	839	Raritan Bay	4.2	Oct. 22, 1892	1 05
Henry Burbank	1,038	Raritan Bay	5.0	June 27, 1890	1 25
Bedell & Lang	114	Raritan Bay	10.5	May 23, 1889	2 63
Lyman W. Bedell	115	Raritan Bay	8.4	Oct. 11, 1887	2 10
Lyman W. Bedell	204	Raritan Bay	11.5	Jan. 13, 1888	2 88
Lyman W. Bedell	221	Raritan Bay	4.8	Feb. 17, 1888	1 20
Lyman W. Bedell	206	Raritan Bay	4.8	Feb. 4, 1888	1 20
Lyman W. Bedell	223	Raritan Bay	3.6	Feb. 4, 1888	90
Lyman W. Bedell	219	Raritan Bay	3.0	Feb. 4, 1888	75
Lyman W. Bedell	225	Raritan Bay	1.6	Feb. 4, 1888	40
Lyman W. Bedell	213	Raritan Bay	1.6	Feb. 17, 1888	40
Charles Bedell	183	Raritan Bay	2.0	Jan. 20, 1888	50
Charles Bedell	821	Raritan Bay	1.8	April 17, 1888	45
Charles Bedell	820	Raritan Bay	3.2	May 15, 1888	80
Charles Bedell	767	Raritan Bay	3.3	May 25, 1891	83
Charles Bedell	770	Raritan Bay	1.4	Dec. 20, 1887	35
B. F. & H. E. Bush	456	Raritan Bay	1.6	Aug. 25, 1890	40
B. F. & H. E. Bush	468	Raritan Bay	5.3	Oct. 24, 1887	1 33
B. F. & H. E. Bush	467	Raritan Bay	4.15	Nov. 14, 1887	1 04
B. F. & H. E. Bush	481	Raritan Bay	47.0	Oct. 24, 1887	11 75
B. F. & H. E. Bush	861	Raritan Bay	25.2	Mar. 3, 1888	6 30
Wm. P. Burbank	509	Raritan Bay	3.9	Dec. 19, 1887	1 00
Chas. Bogardus, Jr	655	Raritan Bay	7.4	Jan. 3, 1888	1 85
Wm. D. Bush	11	Raritan Bay	2.5	Oct. 24, 1887	63
Wm. D. Bush	457	Raritan Bay	3.7	Oct. 24, 1887	92
Daniel Burbank	288	Raritan Bay	15.4	Jan. 17, 1888	3 85
Daniel Burbank	382	Raritan Bay	16.8	Nov. 4, 1887	4 20
Daniel Burbank	380	Raritan Bay	12.0	Nov. 4, 1887	3 00
Daniel Burbank	386	Raritan Bay	5.3	Nov. 4, 1887	1 33
Daniel Burbank	696	Raritan Bay	19.9	Jan. 19, 1888	4 97
Daniel Burbank	862	Raritan Bay	24.6	Aug. 9, 1892	6 15
Adeline Bedell	185	Raritan Bay	1.2	Jan. 19, 1888	30
Wm. Buchanan	42	Raritan Bay	4.7	Nov. 11, 1887	1 18
Wm. Buchanan	690	Raritan Bay	2.5	Jan. 3, 1888	63
Geo. S. Burbank	858	Raritan Bay	12.0	Nov. 7, 1887	3 00
Jos. M. Belford	Several	Long Island Sound	70.0	Jan. 12, 1889	17 50
Jos. M. Belford	Several	Long Island Sound	60.0	Mar. 18, 1891	15 00
Jos. M. Belford	Several	Long Island Sound	120.0	Mar. 18, 1891	30 00
John M. Benner	44	Long Island Sound	8.8	June 17, 1888	2 20
John M. Benner	50	Long Island Sound	8.8	June 25, 1888	2 20
John M. Benner	46	Long Island Sound	8.8	June 7, 1888	2 20
John M. Benner	45	Long Island Sound	8.8	June 6, 1888	2 20
John M. Benner	47	Long Island Sound	8.8	Nov. 28, 1887	2 20
John M. Benner	51	Long Island Sound	8.8	June 6, 1888	2 20

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
John M. Benner	49	Long Island Sound	8.8	June 6, 1888	$2 20
John M. Benner	43	Long Island Sound	8.8	June 9, 1888	2 20
John M. Benner	48	Long Island Sound	8.8	Aug. 16, 1888	2 20
John M. Benner	42	Long Island Sound	8.8	June 6, 1888	2 20
John M. Benner	2	Long Island Sound	67.2	June 4, 1888	16 80
John M. Benner	67	Long Island Sound	12.3	July 2, 1888	3 07
John M. Benner	55	Long Island Sound	14.0	May 8, 1888	3 50
John M. Benner	8	Long Island Sound	75.3	Dec. 27, 1887	18 83
John M. Benner	68	Long Island Sound	28.2	Sept. 1, 1888	7 05
Roscoe Bishop	9	Long Island Sound	38.7	Nov. 14, 1887	9 67
O. &. M. G. Bartow	10	Long Island Sound	17.5	Oct. 28, 1887	4 38
Jacob Bumstead	66	Long Island Sound	18.0	Nov. 3, 1887	4 50
F. T. Boerum	27	Little Neck Bay	2.5	July 8, 1889	63
Peter Cannon	733	Raritan Bay	.2	Nov. 26, 1887	05
Alfred W. Cannon	454	Raritan Bay	.8	Nov. 12, 1889	20
Thomas Colon	448	Raritan Bay	.9	Jan. 18, 1888	23
D. B. Colon	418½	Raritan Bay	1.7	Oct. 19, 1887	43
John W. Cole	469	Raritan Bay	1.1	Oct. 20, 1887	28
John W. Cole	507	Raritan Bay	4.9	Dec. 19, 1887	1 22
William Cooley	277	Raritan Bay	5.3	April 7, 1888	1 33
Andrew M. Cannon	45	Raritan Bay	.7	Nov. 7, 1887	18
Andrew M. Cannon	736	Raritan Bay	2.2	Nov. 7, 1887	55
Geo. W. Chauncey	Several	Long Island Sound	100.0	May 26, 1899	25 00
B. W. Carll	Several	Long Island Sound	90.0	Jan. 12, 1899	22 50
B. W. Carll	Several	Long Island Sound	120.0	Mar. 18, 1891	30 00
Jas. A. Cochrane	13	Long Island Sound	61.2	Oct. 28, 1887	15 30
Geo. E. Carll	41	Long Island Sound	74.9	Nov. 5, 1887	18 73
F. K. Conant	Several	Little Neck Bay	7.5	Feb. 12, 1889	1 88
F. K. Conant	Several	Little Neck Bay	5.0	Jan. 8, 1889	1 25
Henry DeHart	866	Raritan Bay	12.6	Oct. 10, 1892	3 15
Henry DeHart	1	Raritan Bay	7.8	Feb. 14, 1898	1 95
Henry DeHart	429	Raritan Bay	38.8	Feb. 13, 1888	9 70
Henry DeHart	427	Raritan Bay	16.0	Feb. 13, 1888	4 00
Henry DeHart	419	Raritan Bay	16.1	Feb. 14, 1888	4 03
Henry DeHart	421	Raritan Bay	7.1	Feb. 14, 1888	1 77
C. V. Decker	870	Raritan Bay	3.6	Nov. 14, 1887	90
C. V. Decker	876	Raritan Bay	38.4	Nov. 12, 1887	9 60
C. V. Decker	50	Raritan Bay	1.2	Nov. 28, 1887	30

C. V. Decker	444	Raritan Bay	6.3	Jan. 16, 1888	1 58
C. V. Decker	851	Raritan Bay	7.8	Nov. 14, 1887	1 95
C. V. Decker	853	Raritan Bay	7.2	Nov. 14, 1887	1 80
C. C. & C. M. Decker	25	Raritan Bay	.9	Dec. 22, 1887	23
C. C. & C. M. Decker	666	Raritan Bay	1.4	Dec. 22, 1887	35
C. C. & C. M. Decker	670	Raritan Bay	4.7	Dec. 22, 1887	1 18
Sherman Decker	22	Raritan Bay	.5	Dec. 22, 1887	13
Sherman Decker	116	Raritan Bay	1.55	Oct. 30, 1887	39
Sherman Decker	465	Raritan Bay	5.1	Dec. 22, 1887	1 28
Sherman Decker	466	Raritan Bay	4.0	Dec. 22, 1887	1 00
Sherman Decker	668	Raritan Bay	4.4	Dec. 22, 1887	1 10
Sherman Decker	681	Raritan Bay	3.3	Dec. 22, 1887	83
Sherman Decker	687	Raritan Bay	6.0	Mar. 18, 1891	1 50
Sherman Decker	778	Raritan Bay	3.5	Dec. 22, 1887	88
Sherman Decker	780	Raritan Bay	10.1	Dec. 22, 1887	2 52
T. F. & S. DeHart	10	Raritan Bay	.9	Oct. 14, 1887	23
T. F. & S. DeHart	14	Raritan Bay	1.5	Oct. 14, 1887	37
T. F. & S. DeHart	17	Raritan Bay	.9	Jan. 26, 1888	23
T. F. & S. DeHart	149	Raritan Bay	8.0	Oct. 14, 1887	2 00
T. F. & S. DeHart	145	Raritan Bay	14.6	Oct. 14, 1887	3 65
Alfred Dubois	72	Raritan Bay	2.9	Oct. 18, 1887	73
Alfred Dubois	415	Raritan Bay	2.3	Dec. 19, 1887	58
R. C. Dubois	71	Raritan Bay	6.2	Nov. 28, 1887	1 55
Oscar L. Decker	37	Raritan Bay	1.7	Dec. 15, 1887	43
Almer Decker	18	Raritan Bay	.5	Jan. 19, 1888	13
Almer Decker	724	Raritan Bay	3.2	Jan. 19, 1888	80
Almer Decker	725	Raritan Bay	3.8	Feb. 19, 1891	95
Almer Decker	52	Raritan Bay	.8	Nov. 28, 1887	20
David Decker	686	Raritan Bay	6.6	Mar. 28, 1888	1 65
DeHart & Housman	335	Raritan Bay	1.3	Feb. 13, 1888	33
Chas. M. Decker	734	Raritan Bay	1.5	Nov. 12, 1887	37
Samuel DeHart	136	Raritan Bay	4.5	May 1, 1888	1 13
Fletcher Decker	127	Raritan Bay	2.5	Jan. 10, 1888	34
Fletcher Decker	128B	Raritan Bay	2.8	Oct. 27, 1888	70
J. & J. W. Elsworth Company	784	Raritan Bay	1.6	April 18, 1891	40
J. & J. W. Elsworth Company	623	Raritan Bay	3.9	Jan. 19, 1888	97
J. & J. W. Elsworth Company	621	Raritan Bay	4.2	Oct. 28, 1889	1 05
J. & J. W. Elsworth Company	299	Raritan Bay	3.8	Jan. 9, 1888	95
J. & J. W. Elsworth Company	617	Raritan Bay	11.7	May 28, 1888	2 92
J. & J. W. Elsworth Company	645	Raritan Bay	5.8	Feb. 6, 1888	1 45
J. & J. W. Elsworth Company	632	Raritan Bay	24.7	Mar. 7, 1888	6 17
J. & J. W. Elsworth Company	619	Raritan Bay	11.8	Dec. 8, 1887	2 95
J. & J. W. Elsworth Company	497	Raritan Bay	3.4	Aug. 6, 1890	85
J. & J. W. Elsworth Company	495	Raritan Bay	12.9	Aug. 6, 1890	3 23
J. & J. W. Elsworth Company	496	Raritan Bay	6.1	Aug. 6, 1890	1 52
J. & J. W. Elsworth Company	443	Raritan Bay	4.4	Feb. 25, 1888	1 10
J. & J. W. Elsworth Company	441	Raritan Bay	10.0	Feb. 25, 1888	2 50
J. & J. W. Elsworth Company	148	Raritan Bay	67.9	Nov. 13, 1887	16 97

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
J. & J. W. Elsworth Company	197	Raritan Bay	10.0	Oct. 24, 1887	$2 50
J. & J. W. Elsworth Company	701	Raritan Bay	6.7	Oct. 22, 1887	1 67
J. & J. W. Elsworth Company	721	Raritan Bay	7.6	Oct. 18, 1887	1 90
J. & J. W. Elsworth Company	665	Raritan Bay	4.9	Dec. 8, 1889	1 23
J. & J. W. Elsworth Company	742	Raritan Bay	1.5	Dec. 8, 1887	38
J. & J. W. Elsworth Company	855	Raritan Bay	17.7	May 12, 1888	4 42
J. & J. W. Elsworth Company	648	Raritan Bay	5.6	Jan. 19, 1891	1 40
J. & J. W. Elsworth Company	650	Raritan Bay	11.9	Nov. 26, 1887	2 98
J. & J. W. Elsworth Company	124	Raritan Bay	1.8	Oct. 24, 1887	45
J. & J. W. Elsworth Company	432	Raritan Bay	3.4	Oct. 24, 1887	85
J. & J. W. Elsworth Company	360	Raritan Bay	6.5	April 27, 1888	1 62
J. & J. W. Elsworth Company	362	Raritan Bay	1.1	April 22, 1888	28
J. & J. W. Elsworth Company	786	Raritan Bay	1.8	April 15, 1891	45
J. & J. W. Elsworth Company	305	Raritan Bay	1.2	Jan. 9, 1888	30
J. & J. W. Elsworth Company	680	Raritan Bay	1.3	Jan. 9, 1888	32
J. & J. W. Elsworth Company	801	Raritan Bay	8.6	Dec. 19, 1887	2 15
J. & J. W. Elsworth Company	758	Raritan Bay	3.1	Aug. 14, 1888	78
J. & J. W. Elsworth Company	809	Raritan Bay	1.4	May 31, 1887	35
J. & J. W. Elsworth Company	810	Raritan Bay	1.4	Mar. 5, 1888	35
J. & J. W. Elsworth Company	202	Raritan Bay	4.6	Nov. 11, 1887	1 15
J. & J. W. Elsworth Company	367	Raritan Bay	4.3	Dec. 12, 1887	1 07
J. & J. W. Elsworth Company	505	Raritan Bay	6.1	Sept. 2, 1890	1 52
J. & J. W. Elsworth Company	172	Raritan Bay	10.0	Jan. 23, 1888	2 50
J. & J. W. Elsworth Company	487	Raritan Bay	21.2	Oct. 25, 1887	5 30
J. & J. W. Elsworth Company	692	Raritan Bay	17.0	Mar. 28, 1888	4 25
J. & J. W. Elsworth Company	87	Raritan Bay	2.7	Oct. 18, 1887	68
J. & J. W. Elsworth Company	785	Raritan Bay	37.8	Jan. 18, 1891	9 45
J. & J. W. Elsworth Company	556	Raritan Bay	2.0	May 15, 1888	50
J. & J. W. Elsworth Company	234	Raritan Bay	2.0	Jan. 9, 1888	50
J. & J. W. Elsworth Company	602	Raritan Bay	1.7	Feb. 20, 1888	43
J. & J. W. Elsworth Company	631	Raritan Bay	1.5	Dec. 8, 1887	38
J. & J. W. Elsworth Company	208	Raritan Bay	1.6	Feb. 4, 1888	40
J. & J. W. Elsworth Company	625	Raritan Bay	2.6	Dec. 8, 1887	65
J. & J. W. Elsworth Company	633	Raritan Bay	2.0	Jan. 31, 1888	50
J. & J. W. Elsworth Company	269	Raritan Bay	3.4	Nov. 11, 1887	85
J. & J. W. Elsworth Company	629	Raritan Bay	1.4	Dec. 8, 1887	35
J. & J. W. Elsworth Company	273	Raritan Bay	2.8	Nov. 11, 1887	70
J. & J. W. Elsworth Company	618	Raritan Bay	1.7	Oct. 11, 1889	42
J. & J. W. Elsworth Company	346	Raritan Bay	11.7	Jan. 17, 1888	2 93

J. & J. W. Elsworth Company	557	Raritan Bay	13.9	Dec. 1, 1889	3 47
J. & J. W. Elsworth Company	559	Raritan Bay	5.4	Dec. 1, 1889	1 35
J. & J. W. Elsworth Company	534	Raritan Bay	3.1	Nov. 25, 1887	78
J. & J. W. Elsworth Company	182	Raritan Bay	2.4	Oct. 11, 1887	60
J. & J. W. Elsworth Company	532	Raritan Bay	2.15	Nov. 25, 1887	54
J. & J. W. Elsworth Company	184	Raritan Bay	2.8	Oct. 11, 1887	70
J. & J. W. Elsworth Company	634	Raritan Bay	2.5	Mar. 7, 1888	62
J. & J. W. Elsworth Company	636	Raritan Bay	6.8	Mar. 7, 1888	1 70
J. & J. W. Elsworth Company	638	Raritan Bay	5.3	Mar. 7, 1888	1 32
J. & J. W. Elsworth Company	173	Raritan Bay	76.0	Nov. 11, 1887	19 00
J. & J. W. Elsworth Company	165	Raritan Bay	28.2	Nov. 11, 1887	7 05
J. & J. W. Elsworth Company	166	Raritan Bay	5.9	Feb. 14, 1893	1 48
J. & J. W. Elsworth Company	194	Raritan Bay	6.0	Mar. 7, 1888	1 50
J. & J. W. Elsworth Company	630	Raritan Bay	1.7	Mar. 7, 1888	42
J. & J. W. Elsworth Company	365	Raritan Bay	7.7	Dec. 12, 1887	1 92
J. & J. W. Elsworth Company	373	Raritan Bay	4.6	Dec. 12, 1887	1 15
J. & J. W. Elsworth Company	363	Raritan Bay	8.0	Dec. 12, 1887	2 00
J. & J. W. Elsworth Company	371	Raritan Bay	5.1	Dec. 12, 1888	1 27
J. & J. W. Elsworth Company	369	Raritan Bay	14.6	Dec. 12, 1887	3 65
J. & J. W. Elsworth Company	555	Raritan Bay	9.2	June 29, 1888	2 30
J. & J. W. Elsworth Company	254	Raritan Bay	11.1	Mar. 11, 1890	2 78
J. & J. W. Elsworth Company	637	Raritan Bay	1.7	Feb. 6, 1888	43
J. & J. W. Elsworth Company	842	Raritan Bay	8.2	Mar. 13, 1891	2 05
J. & J. W. Elsworth Company	831	Raritan Bay	3.2	Aug. 6, 1890	80
J. & J. W. Elsworth Company	245	Raritan Bay	5.0	Feb. 27, 1888	1 25
J. & J. W. Elsworth Company	301	Raritan Bay	3.6	Jan. 9, 1888	90
J. & J. W. Elsworth Company	307	Raritan Bay	5.6	Jan. 9, 1888	1 40
J. & J. W. Elsworth Company	788	Raritan Bay	1.8	Jan. 9, 1888	45
J. & J. W. Elsworth Company	105	Raritan Bay	5.0	Oct. 5, 1887	1 25
J. & J. W. Elsworth Company	313	Raritan Bay	14.1	Jan. 9, 1888	3 52
J. & J. W. Elsworth Company	293	Raritan Bay	2.8	Jan. 9, 1888	70
J. & J. W. Elsworth Company	26	Raritan Bay	1.0	Jan. 9, 1888	25
J. & J. W. Elsworth Company	142A	Raritan Bay	22.1	May 27, 1889	5 52
J. & J. W. Elsworth Company	132	Raritan Bay	12.6	Nov. 3, 1887	3 15
J. & J. W. Elsworth Company	303	Raritan Bay	2.2	Jan. 9, 1888	55
J. & J. W. Elsworth Company	393	Raritan Bay	3.4	Feb. 21, 1888	85
J. & J. W. Elsworth Company	782	Raritan Bay	1.8	Jan. 9, 1888	45
J. & J. W. Elsworth Company	517	Raritan Bay	2.6	Oct. 20, 1887	65
J. & J. W. Elsworth Company	615	Raritan Bay	14.9	May 24, 1888	3 73
J. & J. W. Elsworth Company	811	Raritan Bay	4.8	Mar. 30, 1888	1 20
J. & J. W. Elsworth Company	439	Raritan Bay	4.0	Feb. 25, 1888	1 00
J. & J. W. Elsworth Company	554	Raritan Bay	6.1	May 15, 1888	1 52
J. & J. W. Elsworth Company	215	Raritan Bay	12.7	Dec. 28, 1887	3 19
J. & J. W. Elsworth Company	775	Raritan Bay	2.4	Jan. 20, 1888	60
J. & J. W. Elsworth Company	81	Raritan Bay	1.3	April 7, 1888	32
J. & J. W. Elsworth Company	80	Raritan Bay	2.4	Oct. 18, 1887	60
J. & J. W. Elsworth Company	86	Raritan Bay	4.3	Nov. 28, 1887	1 08

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
J. & J. W. Elsworth Company	79	Raritan Bay	1.3	Jan. 19, 1888	$0 32
J. & J. W. Elsworth Company	455A	Raritan Bay	.9	April 6, 1889	23
J. & J. W. Elsworth Company	285	Raritan Bay	1.8	Jan. 2, 1889	45
J. & J. W. Elsworth Company	84	Raritan Bay	7.8	Feb. 7, 1888	1 95
J. & J. W. Elsworth Company	85	Raritan Bay	1.4	Feb. 7, 1888	35
J. & J. W. Elsworth Company	295	Raritan Bay	5.6	Jan. 9, 1888	1 40
J. & J. W. Elsworth Company	673	Raritan Bay	1.8	Feb. 6, 1888	45
J. & J. W. Elsworth Company	169	Raritan Bay	1.6	Nov. 11, 1887	40
J. & J. W. Elsworth Company	111	Raritan Bay	7.8	May 27, 1889	1 95
J. & J. W. Elsworth Company	82	Raritan Bay	1.3	July 2, 1888	32
J. & J. W. Elsworth Company	297	Raritan Bay	4.1	Jan. 9, 1888	1 02
J. & J. W. Elsworth Company	639	Raritan Bay	5.8	Feb. 6, 1888	1 45
J. & J. W. Elsworth Company	667	Raritan Bay	3.4	Feb. 6, 1888	85
J. & J. W. Elsworth Company	672	Raritan Bay	1.1	June 29, 1888	28
J. & J. W. Elsworth Company	755	Raritan Bay	1.6	Mar. 7, 1888	40
J. & J. W. Elsworth Company	643	Raritan Bay	6.8	Feb. 6, 1888	1 70
J. & J. W. Elsworth Company	600	Raritan Bay	3.8	May 15, 1888	95
J. & J. W. Elsworth Company	729	Raritan Bay	1.6	Feb. 6, 1888	40
J. & J. W. Elsworth Company	83	Raritan Bay	2.8	Oct. 18, 1887	70
J. & J. W. Elsworth Company	787	Raritan Bay	10.0	Jan. 31, 1888	2 50
J. & J. W. Elsworth Company	647	Raritan Bay	4.7	Feb. 6, 1888	1 18
J. & J. W. Elsworth Company	730	Raritan Bay	2.4	Feb. 6, 1888	60
J. & J. W. Elsworth Company	641	Raritan Bay	4.2	Feb. 6, 1888	1 05
J. & J. W. Elsworth Company	575	Raritan Bay	9.6	Nov. 10, 1887	2 40
J. & J. W. Elsworth Company	364	Raritan Bay	1.0	Dec. 7, 1889	25
J. & J. W. Elsworth Company	376	Raritan Bay	5.4	Oct. 11, 1887	1 35
Elsworth & Polworth	130	Raritan Bay	7.2	Oct. 13, 1887	1 80
John H. Elsworth	599	Raritan Bay	4.6	Feb. 29, 1888	1 15
J. W. C. Englebrecht	589	Raritan Bay	3.7	Feb. 29, 1888	93
J. W. C. Englebrecht	591	Raritan Bay	2.5	Feb. 29, 1888	60
J. W. C. Englebrecht	874	Raritan Bay	1.4	Jan. 5, 1893	35
Forrester & Hoag	873	Raritan Bay	3.6	Dec. 2, 1887	90
Forrester & Hoag	347	Raritan Bay	5.9	Oct. 20, 1887	1 48
Forrester & Hoag	553	Raritan Bay	1.8	Oct. 20, 1887	45
Forrester & Hoag	669	Raritan Bay	2.55	Jan. 31, 1888	64
Forrester & Hoag	789	Raritan Bay	10.2	Jan. 31, 1888	2 55
Forrester & Hoag	801	Raritan Bay	3.6	Jan. 31, 1888	90
Forrester & Hoag	361	Raritan Bay	1.6	Oct. 20, 1887	40
George E. Forrester	379	Raritan Bay	4.2	Oct. 20, 1887	1 05
George E. Forrester					

George E. Forrester	517	Raritan Bay	2.6	Oct. 20, 1887	65
George E. Forrester	515	Raritan Bay	1.2	Oct. 20, 1887	30
Frazer & Houghwout	176	Raritan Bay	14.8	Jan. 23, 1888	3 70
Frazer & Houghwout	218	Raritan Bay	7.0	June 27, 1890	1 75
Frazer & Houghwout	783	Raritan Bay	40.0	Oct. 19, 1887	10 00
Frazer & Houghwout	504	Raritan Bay	9.5	Mar. 11, 1892	2 38
Alexander C. Frazer	21	Raritan Bay	.7	Oct. 5, 1887	17
H. Fletcher Fordham	73	Long Island Sound	69.0	Sept. 30, 1892	17 25
H. Fletcher Fordham	74	Long Island Sound	69.0	Sept. 30, 1892	17 25
Daniel Green	798	Raritan Bay	.6	Oct. 7, 1890	15
Daniel Green	800	Raritan Bay	2.6	Oct. 7, 1890	65
Glenwood Oyster Company	Several	Long Island Sound	240.0	Dec. 8, 1891	60 00
L. Gilson Griffing	13	Long Island Sound	83.6	Oct. 28, 1887	20 90
William F. Hoyt	Several	Long Island Sound	34.2	Jan. 12, 1892	8 55
John S. Hoag	875	Raritan Bay	.8	Jan. 5, 1893	20
Haviland & Odell	384	Raritan Bay	7.5	Oct. 25, 1887	1 87
Haviland & Odell	8	Little Neck Bay	2.5	Jan. 8, 1889	63
Haviland & Odell	5-6-7	Little Neck Bay	7.5	Jan. 8, 1889	1 88
Haviland & Odell	15	Little Neck Bay	2.5	Jan. 8, 1889	62
Wm. H. Houghwout	486	Raritan Bay	6.2	Nov. 3, 1887	1 55
Wm. H. Houghwout	512	Raritan Bay	2.5	Nov. 5, 1887	63
Wm. H. Houghwout	694	Raritan Bay	42.2	Jan. 20, 1891	10 55
Thomas W. Holbert	603	Raritan Bay	2.5	April 16, 1888	63
Thomas W. Holbert	605	Raritan Bay	1.8	April 16, 1888	45
Thomas W. Holbert	607	Raritan Bay	7.3	April 16, 1888	1 83
G. J. Jennings	128	Raritan Bay	2.4	May 27, 1889	60
Theodore Johnson	39	Raritan Bay	6	Mar. 29, 1888	15
Theodore Johnson	38	Raritan Bay	5	Jan. 3, 1888	13
Theodore Johnson	426	Raritan Bay	7	Feb. 10, 1888	18
Theodore Johnson	35	Raritan Bay	8	April 9, 1891	20
Theodore Johnson	731	Raritan Bay	9	Oct. 28, 1887	22
Nelson Jacklin	192	Raritan Bay	1.0	Mar. 7, 1888	25
Nelson Jacklin	546	Raritan Bay	3.9	May 15, 1888	98
Nelson Jacklin	556	Raritan Bay	2.0	May 15, 1888	50
Nelson Jacklin	774	Raritan Bay	1.4	May 23, 1888	35
Nelson Jacklin	790	Raritan Bay	1.0	May 23, 1888	25
Nelson Jacklin	828	Raritan Bay	2.0	May 28, 1888	50
E. A. Joline	302	Raritan Bay	4.3	Jan. 11, 1888	1 07
William Joline	70	Raritan Bay	10.5	Oct. 27, 1887	2 63
David Joline	9	Raritan Bay	1.3	Oct. 17, 1887	33
David Joline	306	Raritan Bay	9.9	Oct. 17, 1887	2 47
David Joline	324	Raritan Bay	5.0	Oct. 17, 1887	1 25
David Joline	230	Raritan Bay	3.6	Oct. 17, 1887	90
David Joline	292	Raritan Bay	4.9	Oct. 17, 1887	1 23
Seth C. Joline	116	Raritan Bay	1.55	Oct. 30, 1889	39
Seth C. Joline	611	Raritan Bay	1.85	Oct. 30, 1889	46
Frank Joline	300	Raritan Bay	4.1	June 9, 1888	1 03
A. S. Joline	58	Raritan Bay	11.4	Nov. 3, 1887	2 85

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
A. S. Joline	340	Raritan Bay	1.6	Dec. 13, 1887	$0 40
A. S. Joline	242	Raritan Bay	6.3	Jan. 16, 1888	1 58
A. S. Joline	59	Raritan Bay	4.1	Dec. 14, 1891	1 03
A. S. Joline	435	Raritan Bay	5.3	Jan. 23, 1888	1 32
A. S. Joline	675	Raritan Bay	5.2	Dec. 14, 1891	1 30
A. S. Joline	745	Raritan Bay	10.0	Jan. 25, 1892	2 50
A. S. Joline	912	Raritan Bay	3.0	Nov. 11, 1887	75
A. S. Joline	972	Raritan Bay	1.7	Oct. 20, 1887	43
Heirs of B. Joline	290	Raritan Bay	3.0	Oct. 17, 1887	75
S. C., E. A. & M. L. Joline	837	Raritan Bay	23.6	June 13, 1891	5 90
S. C., E. A. & M. L. Joline	857	Raritan Bay	1.8	Oct. 13, 1890	45
Joline Brothers	760	Raritan Bay	4.8	Dec. 19, 1887	1 20
Joline Brothers	343	Raritan Bay	4.1	June 27, 1890	1 02
John Journeay	88	Raritan Bay	2.5	July 2, 1888	63
Jones & Burbank	502	Raritan Bay	14.4	Jan. 19, 1888	3 60
Jones & Burbank	500	Raritan Bay	40.0	Jan. 19, 1888	10 00
Jones & Burbank	510	Raritan Bay	3.3	Jan. 19, 1888	83
Jones & Burbank	695	Raritan Bay	19.6	Jan. 19, 1888	4 90
Henderson Journeay	595	Raritan Bay	1.5	April 16, 1888	38
Henderson Journeay	597	Raritan Bay	2.7	April 16, 1888	67
Thos. L. Jobes	579	Raritan Bay	1.4	Nov. 10, 1887	35
Thos. L. Jobes	573	Raritan Bay	1.2	Nov. 10, 1887	30
Thos. L. Jobes	581	Raritan Bay	10.1	Nov. 10, 1887	2 53
Thos. L. Jobes	548	Raritan Bay	3.5	Jan. 31, 1898	88
Thos. L. Jobes	550	Raritan Bay	5.3	Jan. 31, 1888	1 33
Thos. L. Jobes	840	Raritan Bay	1.6	Feb. 9, 1892	40
David Johnson	167	Raritan Bay	2.0	Nov. 11, 1887	50
David Johnson	262	Raritan Bay	1.8	Aug. 29, 1889	45
David Johnson	604	Raritan Bay	1.4	Feb. 20, 1888	35
David Johnson	606	Raritan Bay	2.2	Feb. 20, 1888	55
David Johnson	608	Raritan Bay	2.6	Feb. 20, 1888	65
David Johnson	610	Raritan Bay	1.1	Feb. 20, 1888	28
Jos. L. Kerrigan	15	Long Island Sound	197.8	Oct. 25, 1887	49 45
A. M. Kemp	70	Long Island Sound	11.8	Sept. 8, 1891	2 95
A. S. Lamb	32	Long Island Sound	79.4	Nov. 5, 1887	19 85
Richard W. LaForge	872	Raritan Bay	0.8	Dec. 28, 1892	20
Richard W. LaForge	212	Raritan Bay	1.5	Feb. 4, 1888	38
Richard W. LaForge	143	Raritan Bay	1.0	Dec. 28, 1892	25
Clarence Lissenden	172	Raritan Bay	5.0	Jan. 23, 1888	1 25

Elsworth B. Lewis	177	Raritan Bay	1.6	Jan. 20, 1888	40
Elsworth B. Lewis	189	Raritan Bay	1.2	Jan. 20, 1888	30
Elsworth B. Lewis	191	Raritan Bay	0.5	Jan. 8, 1889	13
Elsworth B. Lewis	175	Raritan Bay	1.5	Jan. 20, 1888	37
Elsworth B. Lewis	181	Raritan Bay	5.0	Jan. 20, 1888	1 25
Elsworth B. Lewis	682	Raritan Bay	0.8	June 17, 1890	20
Elsworth B. Lewis	281	Raritan Bay	5.6	Jan. 9, 1888	1 40
R. W. & W. W. LaForge	592	Raritan Bay	1.6	May 15, 1888	40
W. W. LaForge	596	Raritan Bay	3.9	May 15, 1888	97
W. W. LaForge	594	Raritan Bay	1.5	Aug. 1, 1888	37
W. W. LaForge	142B	Raritan Bay	3.5	May 27, 1889	87
W. W. LaForge	123	Raritan Bay	3.4	Mar. 21, 1892	85
W. W. LaForge	422½	Raritan Bay	2.9	Oct. 19, 1887	73
LaForge & Thompson	358	Raritan Bay	3.0	Jan. 13, 1888	75
J. E. LaForge	366	Raritan Bay	2.1	Jan. 13, 1888	53
J. E. LaForge	433	Raritan Bay	13.0	May 14, 1888	3 25
Abraham Latourette	863	Raritan Bay	18.8	Dec. 9, 1889	4 70
Azel F. Merrell	877	Raritan Bay	6.2	Dec. 22, 1892	1 55
Azel F. Merrell	864	Raritan Bay	25.4	Nov. 7, 1887	6 35
Azel F. Merrell	159	Raritan Bay	12.3	Oct. 27, 1887	3 08
Azel F. Merrell	430	Raritan Bay	3.4	Oct. 27, 1887	85
Azel F. Merrell	278	Raritan Bay	4.9	Feb. 10, 1888	1 23
Azel F. Merrell	494	Raritan Bay	5.1	Aug. 6, 1890	1 28
Azel F. Merrell	508	Raritan Bay	6.0	Mar. 11, 1892	1 50
Azel F. Merrell	428	Raritan Bay	5.9	May 31, 1888	1 48
Azel F. Merrell	118	Raritan Bay	5.2	Nov. 11, 1887	1 30
Azel F. Merrell	434	Raritan Bay	1.3	Dec. 13, 1887	33
Azel F. Merrell	485	Raritan Bay	10.2	Nov. 3, 1887	2 55
Azel F. Merrell	270	Raritan Bay	8.8	Jan. 13, 1888	2 20
Azel F. Merrell	282	Raritan Bay	9.5	Jan. 13, 1888	2 38
Azel F. Merrell	437	Raritan Bay	2.9	Feb. 25, 1888	73
Azel F. Merrell	280	Raritan Bay	4.0	Jan. 13, 1888	1500
Azel F. Merrell	3	Raritan Bay	5.1	Dec. 1, 1887	1 27
Azel F. Merrell	276	Raritan Bay	22.8	Jan. 13, 1888	5 70
Azel F. Merrell	193	Raritan Bay	11.9	Oct. 25, 1887	2 98
Azel F. Merrell	161	Raritan Bay	6.8	Oct. 26, 1887	1 70
Azel F. Merrell	195	Raritan Bay	8.5	Oct. 25, 1887	2 12
Azel F. Merrell	160	Raritan Bay	11.1	Oct. 25, 1887	2 78
Azel F. Merrell	266	Raritan Bay	3.0	Oct. 18, 1887	75
Azel F. Merrell	168	Raritan Bay	6.6	Oct. 25, 1887	1 65
Azel F. Merrell	170	Raritan Bay	6.0	Oct. 25, 1887	1 50
Azel F. Merrell	484	Raritan Bay	3.4	Nov. 3, 1887	85
Azel F. Merrell	162	Raritan Bay	17.5	Oct. 25, 1887	4 38
Azel F. Merrell	674	Raritan Bay	2.8	Dec. 10, 1887	70
Azel F. Merrell	743	Raritan Bay	0.6	Jan. 13, 1888	15
Azel F. Merrell	869	Raritan Bay	1.8	Dec. 17, 1887	45
John B. Merrell	230	Raritan Bay	22.8	Oct. 25, 1887	5 70
Abram Martineau	865	Raritan Bay	11.0	Nov. 5, 1892	2 75
Abram Martineau					

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax.
Abram Martineau	8	Raritan Bay	1.2	Nov. 5, 1887	$0 30
Abram Martineau	385	Raritan Bay	4.2	Nov. 5, 1887	1 05
Abram Martineau	228	Raritan Bay	9.0	Nov. 5, 1887	2 25
Abram Martineau	377	Raritan Bay	4.0	Nov. 5, 1887	1 00
Abram Martineau	506	Raritan Bay	8.95	Oct. 25, 1887	2 24
Abram Manee	461	Raritan Bay	2.0	May 26, 1888	50
Abram Manee	808	Raritan Bay	4.4	May 26, 1888	1 10
Abram Manee	815	Raritan Bay	4.8	May 26, 1888	1 20
Abram Manee	817	Raritan Bay	2.0	May 26, 1888	50
Abram & Wm. Manee	806	Raritan Bay	3.4	May 26, 1888	85
Abram & Wm. Manee	814	Raritan Bay	6.6	May 26, 1888	1 65
Abram & Wm. Manee	816	Raritan Bay	3.0	May 26, 1888	75
Abram & Wm. Manee	819	Raritan Bay	4.4	May 26, 1888	1 10
Abram & Wm. Manee	832	Raritan Bay	1.1	May 26, 1888	28
Lillie Merrell	677	Raritan Bay	2.0	Dec. 10, 1888	50
Mersereau & Lewis	669	Raritan Bay	2.55	Jan. 31, 1888	63
J. J. Manee	658	Raritan Bay	.4	Nov. 11, 1887	10
J. J. Manee	64	Raritan Bay	4.0	Nov. 11, 1887	1 00
William Manee, Sr	536	Raritan Bay	1.7	Nov. 26, 1887	43
William Manee, Sr	544	Raritan Bay	2.1	Nov. 25, 1887	52
George H. Manee	542	Raritan Bay	1.3	Nov. 25, 1887	33
Wilbur N. Manee	69	Raritan Bay	2.2	Nov. 2, 1887	55
Wilbur N. Manee	76	Raritan Bay	2.1	Nov. 2, 1887	53
Wilbur N. Manee	77	Raritan Bay	2.0	Nov. 2, 1887	50
Wilbur N. Manee	66	Raritan Bay	2.0	Nov. 2, 1887	50
Wilbur N. Manee	156	Raritan Bay	2.1	May 28, 1888	53
Wilbur N. Manee	420	Raritan Bay	3.3	Oct. 19, 1887	82
Wilbur N. Manee	452	Raritan Bay	2.3	Jan. 18, 1888	58
Wilbur N. Manee	68	Raritan Bay	.8	April 6, 1889	20
Wilbur N. Manee	341	Raritan Bay	2.2	June 27, 1890	55
Wilbur N. Manee	67	Raritan Bay	5.3	Nov. 2, 1887	1 32
Wilbur N. Manee	418	Raritan Bay	4.3	Oct. 19, 1887	1 07
Marshall & Bedell	772	Raritan Bay	2.3	Dec. 20, 1887	58
E. P. Manee	63	Raritan Bay	5.5	Oct. 5, 1887	1 35
George Marshall	231	Raritan Bay	4.0	Jan. 16, 1888	1 00
George Marshall	267	Raritan Bay	6.8	Jan. 15, 1888	1 70
Marcellus T. Merrell	395	Raritan Bay	5.2	May 19, 1888	1 30
Marcellus T. Merrell	397	Raritan Bay	4.8	Jan. 14, 1888	1 20
John I. Merrell	352	Raritan Bay	4.3	Dec. 13, 1887	1 08

John I. Merrell	258	Raritan Bay	13.8	Nov. 2, 1887	3 45
John I. Merrell	460	Raritan Bay	2.4	Jan. 24, 1890	60
John I. Merrell	474	Raritan Bay	4.5	Nov. 9, 1887	1 13
John I. Merrell	475	Raritan Bay	7.5	Nov. 9, 1890	1 88
John I. Merrell	476	Raritan Bay	5.1	Nov. 9, 1887	1 28
John I. Merrell	477	Raritan Bay	12.5	Nov. 9, 1887	3 12
John I. Merrell	478	Raritan Bay	13.2	Nov. 9, 1887	3 30
John I. Merrell	446	Raritan Bay	.5	Aug. 11, 1890	12
John I. Merrell	232	Raritan Bay	12.0	June 27, 1890	3 00
John I. Merrell	524	Raritan Bay	8.6	Jan. 16, 1890	2 15
John I. Merrell	504	Raritan Bay	9.5	Mar. 11, 1892	2 37
John I. Merrell	833	Raritan Bay	5.2	July 2, 1888	1 30
John I. Merrell	919	Raritan Bay	14.4	Jan. 9, 1888	3 60
Thomas S. Merrell	527	Raritan Bay	5.1	Dec. 12, 1887	1 28
Thomas S. Merrell	525	Raritan Bay	4.1	Dec. 12, 1887	1 03
Thomas S. Merrell	523	Raritan Bay	.9	Dec. 12, 1887	22
Thomas S. Merrell	533	Raritan Bay	5.4	Dec. 12, 1887	1 35
Thomas S. Merrell	535	Raritan Bay	3.7	Dec. 12, 1887	93
Thomas S. Merrell	844	Raritan Bay	3.0	Oct. 13, 1890	75
Thomas S. Merrell	693	Raritan Bay	2.4	Oct. 8, 1887	60
Thomas S. Merrell	222	Raritan Bay	14.8	June 27, 1890	3 70
Thomas S. Merrell	148A	Raritan Bay	4.8	Nov. 3, 1887	1 20
Thomas S. Merrell	529	Raritan Bay	16.1	Dec. 12, 1887	4 03
John Marshall	649	Raritan Bay	3.8	Jan. 18, 1888	95
John Marshall	651	Raritan Bay	3.6	Jan. 18, 1888	90
John Marshall	661	Raritan Bay	1.9	Jan. 18, 1888	47
John Marshall	671	Raritan Bay	4.95	Jan. 18, 1888	1 24
John Marshall	744	Raritan Bay	4.0	Jan. 18, 1888	1 00
John Marshall	746	Raritan Bay	1.2	Jan. 18, 1888	30
John Marshall	750	Raritan Bay	2.8	Jani 18, 1888	70
Henry S. Marshall	653	Raritan Bay	7.9	Jan. 5, 1888	1 97
George Newbury	635	Raritan Bay	1.2	Feb. 6, 1888	30
James E. Noe	33	Raritan Bay	.9	Jan. 3, 1888	23
James E. Noe	467	Raritan Bay	4.15	Nov. 16, 1887	1 04
James E. Noe	713	Raritan Bay	2.0	May 24, 1888	50
D. O. Noe & Son	5	Raritan Bay	5.7	Jan. 3, 1888	1 42
D. O. Noe & Son	23	Raritan Bay	.8	Dec. 8, 1887	20
D. O. Noe & Son	503	Raritan Bay	8.1	Dec. 19, 1887	2 03
D. O. Noe & Son	27	Raritan Bay	1.4	Dec. 11, 1888	35
D. O. Noe & Son	32	Raritan Bay	.7	Dec. 11, 1888	17
D. O. Noe & Son	43	Raritan Bay	3.0	Dec. 11, 1888	75
D. O. Noe & Son	151	Raritan Bay	.7	Dec. 20, 1887	17
D. O. Noe & Son	150	Raritan Bay	.7	Dec. 20, 1887	18
D. O. Noe & Son	835	Raritan Bay	9.6	July 2, 1888	2 40
William C. Porth	325	Raritan Bay	8.0	Jan. 10, 1888	2 00
William C. Porth	333	Raritan Bay	1.5	Mar. 11, 1890	37
William C. Porth	319	Raritan Bay	5.0	Jan. 10, 1888	1 25
William C. Porth	323	Raritan Bay	13.8	Jan. 10, 1888	3 45

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
William C. Porth	321	Raritan Bay	3.2	Jan. 10, 1888	$0 80
William C. Porth	231	Raritan Bay	5.2	Jan. 10, 1888	1 30
William C. Porth	327	Raritan Bay	5.0	Jan. 10, 1888	1 25
William C. Porth	412	Raritan Bay	2.5	Nov. 5, 1887	63
William C. Porth	779	Raritan Bay	26.4	Oct. 19, 1887	6 60
William C. Porth	408	Raritan Bay	5.0	Nov. 5, 1887	1 25
William C. Porth	843	Raritan Bay	4.6	Mar. 13, 1891	1 15
William C. Porth	329	Raritan Bay	14.5	Mar. 11, 1890	3 63
William C. Porth	781	Raritan Bay	42.8	Oct. 19, 1887	10 70
Croel Price	140B	Raritan Bay	3.2	June 11, 1888	80
Croel Price	710	Raritan Bay	2.0	May 24, 1888	50
Croel Price	711	Raritan Bay	.5	May 24, 1888	15
Croel Price	738	Raritan Bay	3.0	Dec. 29, 1888	75
Croel Price	48	Raritan Bay	3.4	Nov. 3, 1887	85
Price & Merrell	4	Raritan Bay	4.6	Oct. 7, 1887	80
Polworth & Elsworth	245	Raritan Bay	3.6	Feb. 27, 1888	90
Polworth & Elsworth	157	Raritan Bay	8.3	Feb. 27, 1888	2 07
Polworth & Elsworth	241	Raritan Bay	12.0	Feb. 27, 1888	3 00
Polworth & Elsworth	243	Raritan Bay	7.0	Feb. 27, 1888	1 75
Polworth & Elsworth	247	Raritan Bay	6.5	Feb. 27, 1888	1 63
Polworth & Elsworth	233	Raritan Bay	11.0	Feb. 27, 1888	2 75
Polworth & Elsworth	436	Raritan Bay	4.3	Feb. 27, 1888	1 07
Polworth & Elsworth	511	Raritan Bay	13.5	Feb. 27, 1888	3 37
Polworth & Elsworth	513	Raritan Bay	2.3	Feb. 27, 1888	58
Polworth & Elsworth	438	Raritan Bay	8.0	Feb. 27, 1888	2 00
Polworth & Elsworth	235	Raritan Bay	6.4	Feb. 27, 1888	1 60
Polworth & Elsworth	237	Raritan Bay	14.4	Feb. 27, 1888	3 60
Polworth & Elsworth	239	Raritan Bay	20.5	Feb. 27, 1888	5 12
Polworth & Elsworth	251	Raritan Bay	2.6	Feb. 27, 1888	65
Polworth & Elsworth	558	Raritan Bay	5.5	Jan. 31, 1888	1 38
Polworth & Elsworth	372	Raritan Bay	2.0	Oct. 11, 1887	50
Polworth & Elsworth	628	Raritan Bay	1.1	Mar. 7, 1888	27
Polworth & Elsworth	956	Raritan Bay	2.0	Mar. 3, 1888	50
Polworth & Elsworth	657	Raritan Bay	1.8	Jan. 5, 1888	45
Polworth & Elsworth	659	Raritan Bay	4.0	Jan. 5, 1888	1 00
Polworth & Elsworth	133	Raritan Bay	1.9	Dec. 24, 1887	48
Charles E. Palmer & Son	671	Raritan Bay	4.95	Jan. 18, 1888	1 23
C. E., C. F. & H. Palmer	859	Raritan Bay	64.8	Mar. 3, 1888	16 20
Elmer I. Palmer	953	Raritan Bay	4.6	Jan. 5 1888	1 15

David Price	110	Raritan Bay	1.0	Jan. 10, 1888	25
David Price	30	Raritan Bay	1.8	Dec. 28, 1887	45
Elmer Price	6	Raritan Bay	1.0	Oct. 18, 1887	25
Elmer Price	140	Raritan Bay	3.3	Oct. 18, 1887	83
Elmer Price	274	Raritan Bay	1.8	Oct. 18, 1887	45
Elmer Price	260	Raritan Bay	3.0	Oct. 18, 1887	75
Elmer Price	264	Raritan Bay	1.2	Oct. 18, 1888	30
Elmer Price	368	Raritan Bay	1.6	Oct. 18, 1887	40
Elmer Price	250	Raritan Bay	1.5	Oct. 27, 1888	38
Elmer Price	244	Raritan Bay	.8	Oct. 18, 1887	20
Elmer Price	272	Raritan Bay	2.0	Oct. 18, 1887	50
Elmer Price	712	Raritan Bay	1.4	Oct. 18, 1887	35
J. H. Price	196	Raritan Bay	1.1	Aug. 14, 1890	27
J. H. Price	198	Raritan Bay	2.0	Aug. 14, 1890	50
E. M. Post	526	Raritan Bay	4.0	Jan. 16, 1890	1 00
E. M. Post	520	Raritan Bay	6.5	Feb. 16, 1888	1 63
E. M. Post	516	Raritan Bay	7.5	Jan. 15, 1888	1 87
E. M. Post	514	Raritan Bay	3.1	Jan. 16, 1888	78
Nils Pedersen	134	Raritan Bay	4.3	Oct. 24, 1887	1 07
Pausch Brothers	12	Long Island Sound	213.2	Oct. 28, 1887	53 30
Pausch Brothers	13	Long Island Sound	68.4	Oct. 28, 1887	17 10
Pausch Brothers	Several	Long Island Sound	67.0	Dec. 8, 1891	16 75
Purity Blue Point Oyster Company	Several	Long Island Sound	240.0	Dec. 29, 1892	60 00
Charles E. Palmer & Son	Section D	Long Island Sound	58.0	Dec. 8, 1891	14 50
Charles E. Palmer & Son	Section A	Long Island Sound	250.0	Dec. 8, 1891	62 50
Frank Rogers	103	Long Island Sound	29.8	June 3, 1901	7 45
Frank Rogers	36	Long Island Sound	110.4	Oct. 20, 1887	27 60
Frank Rogers	37	Long Island Sound	98.0	Oct. 20, 1887	24 50
Frank Rogers	35	Long Island Sound	139.0	Oct. 20, 1887	34 75
Andrew Radel	98	Long Island Sound	104.0	July 12, 1900	26 00
Andrew Radel	99	Long Island Sound	104.0	June 25, 1900	26 00
Andrew Radel	3	Long Island Sound	173.5	May 1, 1888	43 38
Andrew Radel	75	Long Island Sound	104.6	Sept. 30, 1892	26 15
Andrew Radel	76	Long Island Sound	104.2	Sept. 30, 1892	26 05
Andrew Radel	77	Long Island Sound	104.0	Sept. 30, 1892	26 00
Andrew Radel	78	Long Island Sound	104.0	Dec. 29, 1892	26 00
Andrew Radel Oyster Company	5	Long Island Sound	171.2	May 29, 1888	42 80
Andrew Radel Oyster Company	7	Long Island Sound	235.2	May 8, 1888	58 80
Andrew Radel Oyster Company	4	Long Island Sound	101.3	Jan. 28, 1888	25 33
Andrew Radel Oyster Company	6	Long Island Sound	146.4	Jan. 27, 1888	36 60
Sealshipt Oyster System	Several	Long Island Sound	80.0	Nov. 15, 1898	20 00
Sealshipt Oyster System	Several	Long Island Sound	80.0	Nov. 15, 1888	20 00
Sealshipt Oyster System	Several	Long Island Sound	80.0	Nov. 18, 1898	20 00
Sealshipt Oyster System	Several	Long Island Sound	150.0	Nov. 15, 1898	37 50
Sealshipt Oyster System	240	Long Island Sound	240.0	Nov. 15, 1888	60 00
Sealshipt Oyster System	Several	Long Island Sound	70.0	Nov. 15, 1898	17 50
Sealshipt Oyster System	88	Long Island Sound	128.2	May 3, 1899	32 05
Sealshipt Oyster System	Section C	Long Island Sound	250.0	Feb. 24, 1888	62 50

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
Sealshipt Oyster System	Several	Long Island Sound	100.0	Oct. 1, 1888	$25 00
Sealshipt Oyster System	18	Long Island Sound	249.0	Nov. 7, 1887	62 25
Sealshipt Oyster System	40	Long Island Sound	46.3	Nov. 9, 1887	11 57
Sealshipt Oyster System	26	Long Island Sound	115.7	Nov. 5, 1887	28 92
Sealshipt Oyster System	27	Long Island Sound	193.5	Oct. 27, 1887	48 38
Sealshipt Oyster System	20	Long Island Sound	249.6	Oct. 25, 1887	62 40
Sealshipt Oyster System	21	Long Island Sound	74.5	Nov. 5, 1887	18 63
Sealshipt Oyster System	22	Long Island Sound	58.9	Nov. 5, 1887	14 72
Sealshipt Oyster System	28	Long Island Sound	76.2	Nov. 5, 1887	19 05
Sealshipt Oyster System	Several	Long Island Sound	100.0	Jan. 12, 1889	25 00
Sealshipt Oyster System	19	Long Island Sound	249.0	June 15, 1888	62 25
Sealshipt Oyster System	Several	Long Island Sound	150.0	Dec. 29, 1892	37 50
Sealshipt Oyster System	Several	Long Island Sound	250.0	Mar. 14, 1893	62 50
Sealshipt Oyster System	Several	Long Island Sound	250.0	Mar. 14, 1893	62 50
Sealshipt Oyster System	Several	Long Island Sound	260.0	Nov. 7, 1892	65 00
Sealshipt Oyster System	9	Smithtown Bay	106.6	Oct. 14, 1887	26 65
Sealshipt Oyster System	10	Smithtown Bay	106.1	Oct. 14, 1887	26 53
Sealshipt Oyster System	8	Smithtown Bay	106.4	Oct. 14, 1887	26 60
Sealshipt Oyster System	7	Smithtown Bay	107.8	Oct. 14, 1887	26 95
Sealshipt Oyster System	6	Smithtown Bay	108.9	Oct. 14, 1887	27 23
Sealshipt Oyster System	5	Smithtown Bay	109.5	Oct. 14, 1887	27 38
Sealshipt Oyster System	4	Smithtown Bay	110.2	Oct. 14, 1887	27 55
Sealshipt Oyster System	3	Smithtown Bay	105.0	Oct. 18, 1887	26 22
Sealshipt Oyster System	2	Smithtown Bay	112.8	Oct. 14, 1887	28 20
Sealshipt Oyster System	1	Smithtown Bay	113.2	Oct. 14, 1887	28 30
Sealshipt Oyster System	259	Raritan Bay	6.6	Jan. 31, 1888	1 65
Sealshipt Oyster System	354	Raritan Bay	1.9	Jan. 17, 1888	48
Sealshipt Oyster System	490	Raritan Bay	9.8	Aug. 6, 1890	2 45
Sealshipt Oyster System	498	Raritan Bay	9.5	Aug. 6, 1890	2 37
Sealshipt Oyster System	463	Raritan Bay	6.6	Mar. 3, 1888	1 65
Sealshipt Oyster System	787	Raritan Bay	6.6	Jan. 31, 1888	1 65
Sealshipt Oyster System	891	Raritan Bay	151.2	Dec. 20, 1892	37 80
Arthur C. Sofield	46	Raritan Bay	.7	Dec. 15, 1888	17
Arthur C. Sofield	24	Raritan Bay	.8	Dec. 15, 1888	20
John M. Sleight	129	Raritan Bay	1.1	Nov. 14, 1887	28
John M. Sleight	125	Raritan Bay	11.9	Nov. 14, 1887	2 97
Standard Oyster Company	74	Raritan Bay	6.6	Nov. 3, 1887	1 65
Standard Oyster Company	53	Raritan Bay	6.8	Oct. 12, 1887	1 70
Standard Oyster Company	73	Raritan Bay	3.8	Oct. 12, 1887	95

Standard Oyster Company	41	Raritan Bay	.5	Mar. 29, 1888	13
Standard Oyster Company	186	Raritan Bay	5.1	Oct. 11, 1887	1 28
Standard Oyster Company	147	Raritan Bay	37.6	Oct. 12, 1887	9 40
Standard Oyster Company	174	Raritan Bay	18.4	Jan. 23, 1888	4 60
Standard Oyster Company	240	Raritan Bay	3.2	June 27, 1890	80
Standard Oyster Company	226	Raritan Bay	18.0	June 27, 1890	4 50
Standard Oyster Company	216	Raritan Bay	12.6	June 27, 1890	3 15
Standard Oyster Company	493	Raritan Bay	9.8	Aug. 6, 1890	2 45
Standard Oyster Company	492	Raritan Bay	5.9	Aug. 6, 1890	1 48
Standard Oyster Company	483	Raritan Bay	2.4	Aug. 6, 1890	60
Standard Oyster Company	499	Raritan Bay	5.8	Dec. 3, 1888	1 45
Standard Oyster Company	479	Raritan Bay	8.6	Nov. 16, 1887	2 15
Standard Oyster Company	252	Raritan Bay	20.0	Aug. 9, 1888	5 00
Standard Oyster Company	256	Raritan Bay	25.3	Mar. 11, 1890	6 32
Standard Oyster Company	172	Raritan Bay	9.3	Jan. 23, 1888	2 33
Standard Oyster Company	654	Raritan Bay	8.2	June 27, 1890	2 05
Standard Oyster Company	40	Raritan Bay	.4	Dec. 8, 1892	10
Standard Oyster Company	676	Raritan Bay	167.0	Aug. 11, 1890	41 75
Standard Oyster Company	856	Raritan Bay	5.8	Jan. 23, 1888	1 45
Standard Oyster Company	860	Raritan Bay	11.2	Aug. 12, 1892	2 80
Standard Oyster Company	238	Raritan Bay	29.4	June 27, 1890	7 35
J. & B. K. Simonson	51	Raritan Bay	1.4	Nov. 14, 1887	35
J. & B. K. Simonson	49	Raritan Bay	1.8	Nov. 12, 1887	45
George M. Still	411	Raritan Bay	5.4	May 19, 1888	1 35
George M. Still	253	Raritan Bay	2.6	Feb. 6, 1888	65
George M. Still	401	Raritan Bay	3.0	May 19, 1888	75
George M. Still	171	Raritan Bay	12.8	Nov. 11, 1887	3 20
George M. Still	284	Raritan Bay	6.6	Dec. 11, 1889	1 65
George M. Still	442	Raritan Bay	2.1	Nov. 11, 1887	55
George M. Still	440	Raritan Bay	1.4	May 12, 1888	35
George M. Still	660	Raritan Bay	2.1	Feb. 29, 1888	53
George M. Still	521	Raritan Bay	2.7	Nov. 17, 1887	67
George M. Still	823	Raritan Bay	2.4	Feb. 29, 1888	60
George M. Still	805	Raritan Bay	10.6	May 26, 1888	2 65
George M. Still	824	Raritan Bay	3.2	May 15, 1888	80
George H. Sharett	486	Raritan Bay	6.2	Nov. 3, 1887	1 55
George H. Sharett & wife	238	Raritan Bay	10.0	June 27, 1890	2 50
Bertha Sharett	148	Raritan Bay	4.2	Nov. 3, 1887	1 05
A. W. Sharett	488	Raritan Bay	4.5	Nov. 3, 1887	1 12
A. W. Sharett	506	Raritan Bay	8.95	Oct. 25, 1887	2 24
A. W. Sharett	683	Raritan Bay	3.6	Nov. 9, 1887	90
A. W. Sharett	656	Raritan Bay	13.2	Jan. 11, 1893	3 30
Thomas Silk	613	Raritan Bay	.9	May 28, 1888	23
George W. Sanbeg	522	Raritan Bay	4.2	Nov. 17, 1887	1 05
Steinmire & Fisher	348	Raritan Bay	9.6	Dec. 13, 1887	2 40
Steinmire & Fisher	342	Raritan Bay	5.0	Dec. 13, 1887	1 25
George E. Sprague	751	Raritan Bay	1.0	June 7, 1888	25
David Simonson	822	Raritan Bay	2.8	Feb. 29, 1888	70

FRANCHISES — (*Continued*)

NAME	Lot	Location	Acres	Granted	Tax
David Simonson	825	Raritan Bay	1.4	Feb. 29, 1888	$0 35
Charles B. Sprague	749	Raritan Bay	1.9	Mar. 7, 1888	48
Charles B. Sprague	753	Raritan Bay	1.4	Mar. 7, 1888	35
F. T. Sprague	409	Raritan Bay	2.5	June 13, 1888	63
F. T. Sprague	413	Raritan Bay	2.4	June 14, 1888	60
John S. Sleight	715	Raritan Bay	5.8	Dec. 12, 1887	1 45
C. O. Sprague	355	Raritan Bay	2.5	Jan. 13, 1888	63
C. O. Sprague	286	Raritan Bay	1.7	Jan. 13, 1888	43
S. B. Sprague	65	Raritan Bay	5.2	Oct. 5, 1887	1 30
Charles S. Sofield	34	Raritan Bay	.7	Nov. 2, 1887	17
Charles S. Sofield	28	Raritan Bay	.6	Nov. 2, 1887	15
Wesley Thompson	126	Raritan Bay	5.6	Oct. 31, 1887	1 45
Wesley Thompson	642	Raritan Bay	3.7	June 12, 1888	93
Wesley Thompson	640	Raritan Bay	2.1	June 4, 1888	52
Wesley Thompson	776	Raritan Bay	4.6	June 11, 1888	1 15
W. H. B. Totten	19	Raritan Bay	6.8	Dec. 8, 1888	1 70
R. Lawrence Smith	29	Long Island Sound	74.8	Nov. 5, 1887	18 70
R. Lawrence Smith	33	Long Island Sound	78.7	Nov. 5, 1887	19 67
E. Marshall Smith	30	Long Island Sound	75.6	Nov. 5, 1887	18 90
E. Marshall Smith	31	Long Island Sound	73.2	Nov. 5, 1887	18 30
Standard Oyster Company	A & B	Long Island Sound	250.0	Sept. 4, 1888	62 50
Sterling Oyster Company	Several	Long Island Sound	210.0	Dec. 8, 1891	52 50
Suwassett Oyster Company	101	Long Island Sound	167.4	Aug. 15, 1900	41 85
Suwassett Oyster Company	100	Long Island Sound	104.0	Aug. 15, 1900	26 00
Suwassett Oyster Company	102	Long Island Sound	200.0	Sept. 18, 1900	50 00
Suwassett Oyster Company	72	Long Island Sound	99.2	April 30, 1892	24 80
W. W. Smith	67	Long Island Sound	12.3	July 2, 1888	3 08
John M. Van Wyck	398	Raritan Bay	3.2	Oct. 22, 1898	80
Henry Van Name	56	Raritan Bay	5.6	Oct. 18, 1887	1 40
M. & P. N. Van Name	12	Raritan Bay	6.6	Aug. 18, 1887	1 65
M. & P. N. Van Name	12½	Raritan Bay	.4	Oct. 14, 1888	10
H. S. Van Wagener	567	Raritan Bay	4.0	June 15, 1888	1 00
David W. Van Name	55	Raritan Bay	5.2	Oct. 27, 1887	1 30
David W. Van Name	697	Raritan Bay	1.3	Mar. 12, 1891	32
John H. Vanderveer	Several	Long Island Sound	120.0	Mar. 18, 1891	30 00
John H. Vanderveer	Several	Long Island Sound	110.0	Oct. 13, 1891	27 50
Charles H. Vroom	Several	Long Island Sound	85.8	Jan. 12, 1892	21 45
Christian Walle	279	Raritan Bay	2.2	Jan. 9, 1888	55
Christian Walle	626	Raritan Bay	1.5	Mar. 7, 1888	38

Christian Walle	396	Raritan Bay	1.1	Jan. 14, 1888	28
Christian Walle	679	Raritan Bay	4.7	Jan. 13, 1888	1 18
Christian Walle	394	Raritan Bay	2.2	May 19, 1888	55
Christian Walle	20	Raritan Bay	3.7	Dec. 20, 1887	92
George T. Woglom	769	Raritan Bay	1.7	May 25, 1891	42
A. W. Woglom	777	Raritan Bay	1.9	May 25, 1891	47
A. W. Woglom	765	Raritan Bay	.8	July 2, 1888	20
J. C. Winant	431	Raritan Bay	3.5	Jan. 25, 1888	88
Fred Wagener	491	Raritan Bay	1.5	Aug. 6, 1890	38
G. P. Wright & Son	414½	Raritan Bay	2.15	Nov. 12, 1889	54
Mrs. Charles Zeigler	416	Raritan Bay	2.3	Oct. 18, 1887	58
Mrs. Charles Zeigler	422	Raritan Bay	2.9	Feb. 14, 1888	73
Totals	.....	.....	16,082.95	.....	$4,020 49

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
Emma W. Abrams	268	Jamaica Bay	2.0	Oct. 18, 1909	Oct. 18, 1934	$2 00	$4 00	$0 50
Emma W. Abrams	267	Jamaica Bay	2.2	Oct. 18, 1909	Oct. 18, 1934	2 00	4 40	55
Major G. Abrams	241	Jamaica Bay	13.0	June 8, 1897	June 8, 1912	25	3 25	3 25
Major G. Abrams	628	Jamaica Bay	.6	Oct. 29, 1909	Oct. 29, 1924	2 00	1 20	15
Samuel D. Abrams	401	Jamaica Bay	2.8	July 18, 1898	July 18, 1913	25	70	70
Samuel D. Abrams	402	Jamaica Bay	.4	July 18, 1898	July 18, 1913	25	10	10
Samuel D. Abrams	435	Jamaica Bay	3.0	Mar. 21, 1910	Mar. 21, 1935	2 00	6 00	75
Samuel D. Abrams	384	Jamaica Bay	2.6	Mar. 21, 1910	Mar. 21, 1935	2 00	5 20	65
James H. Abrams	271	Jamaica Bay	2.4	July 13, 1897	July 13, 1912	25	60	60
Floyd Abrams	398	Jamaica Bay	1.2	Jan. 23, 1911	Jan. 23, 1936	2 00	2 40	30
William H. Abrams	244	Jamaica Bay	1.4	June 8, 1897	June 8, 1912	25	35	35
William H. Abrams	240	Jamaica Bay	.4	June 8, 1897	June 8, 1912	25	10	10
William H. Abrams	280	Jamaica Bay	1.4	Nov. 9, 1897	Nov. 9, 1912	25	35	35
G. A. Albright	395	Jamaica Bay	2.0	July 18, 1898	July 18, 1913	25	50	50
G. A. Albright	399	Jamaica Bay	1.4	July 18, 1898	July 18, 1913	25	35	35
John H. Abrams	295	Jamaica Bay	1.4	Aug. 9, 1898	Aug. 9, 1913	25	35	35
John H. Abrams	294	Jamaica Bay	3.8	Aug. 9, 1898	Aug. 9, 1913	25	95	95
John H. Abrams	161	Jamaica Bay	3.0	Oct. 13, 1896	Oct. 13, 1911	25	75	75
E. E. Abrams	161	Jamaica Bay	3.0	Oct. 13, 1896	Oct. 13, 1911	25	75	75
N. S. Ackerly & Son Company	984	Raritan Bay	150.0	Jan. 11, 1911	Jan. 11, 1926	2 00	300 00	37 50
N. S. Ackerly & Son Company	985	Raritan Bay	100.0	July 29, 1911	July 29, 1926	2 00	200 00	25 00
Androvette & Thompson	900	Raritan Bay	9.0	Mar. 10, 1909	Mar. 10, 1934	2 00	18 00	2 25
Androvette & Thompson	979	Raritan Bay	20.0	Sept. 21, 1910	Sept. 21, 1925	2 00	40 00	5 00
Androvette & Thompson	980	Raritan Bay	23.2	Sept. 21, 1910	Sept. 21, 1925	2 00	46 40	5 80
John C. Allen	Sec. B-121	Long Island Sound	22.0	June 14, 1904	June 14, 1919	25	5 50	5 50
John C. Allen	123	Long Island Sound	5.8	June 14, 1904	June 14, 1919	25	1 45	1 45
John C. Allen	90	Long Island Sound	5.8	April 10, 1900	April 10, 1915	25	1 45	1 45
John M. Benner	A69	Long Island Sound	9.4	July 8, 1902	July 8, 1917	25	2 35	2 35
John M. Benner	110	Long Island Sound	25.8	July 8, 1902	July 8, 1917	25	6 45	6 45
John M. Benner	111	Long Island Sound	54.0	Jan. 14, 1902	Jan. 14, 1917	25	13 50	13 50
John M. Benner	112	Long Island Sound	30.4	July 8, 1902	July 8, 1917	25	7 60	7 60
John M. Benner	113	Long Island Sound	242.4	Nov. 12, 1901	Nov. 12, 1918	25	60 60	60 60
John M. Benner	115	Long Island Sound	95.4	July 8, 1902	July 8, 1917	25	23 85	23 85
John M. Benner	116	Long Island Sound	65.4	Feb. 11, 1902	Feb. 11, 1917	25	16 35	16 35
John M. Benner	119	Long Island Sound	17.6	July 8, 1902	July 8, 1917	25	4 40	4 40
John M. Benner	135	Long Island Sound	216.2	May 9, 1905	May 9, 1920	25	54 05	54 05
John M. Benner	124	Long Island Sound	118.2	Sept. 8. 1903	Sept. 8, 1918	25	29 55	29 55
John M. Benner	Several	Long Island Sound	164.4	Dec. 12, 1905	Dec. 12, 1920	25	41 10	41 10
John M. Benner	Several	Long Island Sound	180.0	Dec. 12, 1905	Dec. 12, 1920	25	45 00	45 00

John M. Benner	83	Long Island Sound	77.0	April 10, 1906	April 10, 1921	25	19 25	19 25
John M. Benner	72	Long Island Sound	122.2	Oct. 27, 1908	Oct. 27, 1933	2 00	244 40	30 55
John M. Benner	Several	Long Island Sound	420.0	April 27, 1909	April 27, 1924	2 00	840 00	105 00
John M. Benner	Several	Long Island Sound	150	Sept. 29, 1909	Sept. 29, 1924	2 00	300 00	37 50
John M. Benner	Several	Long Island Sound	342.6	Sept. 29, 1909	Sept. 29, 1924	2 00	685 20	85 85
John M. Bell	268	Long Island Sound	6.8	Nov. 12, 1901	Nov. 12, 1916	25	1 70	1 70
John T. Bird	Sec. B-91	Long Island Sound	24.6	April 10, 1900	April 10, 1950	25	6 15	6 15
Baylis & Thorne	95	Long Island Sound	62.8	April 23, 1900	April 23, 1950	25	15 70	15 70
Baylis & Thorne	Sec. C & F 21	Long Island Sound	43.8	June 14, 1904	June 14, 1919	25	10 95	10 95
Baylis & Thorne	321	Long Island Sound	28.6	Dec. 11, 1910	Dec. 1, 1925	2 00	57 20	7 15
John Bell	251	Long Island Sound	6.4	Dec. 10, 1901	Dec. 10, 1916	25	1 60	1 60
Oswald T. Bergen	272	Long Island Sound	11.2	Mar. 11, 1902	Mar. 11, 1917	25	2 80	2 80
Bell, Fordham & Bell	89	Long Island Sound	12.8	Jan. 9, 1900	Jan. 9, 1917	25	3 20	3 20
Baylis, Bumstead & Fletcher	Several	Long Island Sound	180.2	Aug. 13, 1902	Aug. 13, 1916	25	45 05	45 05
Daniel Burbank	890	Raritan Bay	19.8	Jan. 8, 1909	Jan. 8, 1924	2 00	39 60	4 95
Henry Borwegen	310	Jamaica Bay	17.0	April 12, 1898	April 12, 1913	25	4 25	4 25
Henry Borwegen	50	Jamaica Bay	1.6	Aug. 31, 1908	Aug. 31, 1933	2 00	3 20	40
Henry Borwegen	48	Jamaica Bay	2.8	Aug. 31, 1908	Aug. 31, 1933	2 00	5 60	70
James W. Barnes	300	Jamaica Bay	7.2	Feb. 8, 1898	Feb. 8, 1913	25	1 80	1 80
G. S. Braisted	482	Jamaica Bay	6.0	Dec. 14, 1897	Dec. 14, 1912	25	1 50	1 50
James Boerum	475	Jamaica Bay	6.2	July 18, 1898	July 18, 1913	25	1 55	1 55
F. A. Brimlow	320	Jamaica Bay	3.4	Mar. 8, 1898	Mar. 8, 1913	25	85	85
Richard Biggs, Sr	627	Jamaica Bay	3.2	Oct. 29, 1909	Oct. 29, 1924	2 00	6 40	80
James A. Bailey	603	Jamaica Bay	33.2	Aug. 12, 1902	Aug. 12, 1917	25	8 30	8 30
C. Josephine Biggs	144	Jamaica Bay	3.0	June 26, 1908	June 26, 1933	2 00	6 00	75
C. Josephine Biggs	524	Jamaica Bay	4.0	June 26, 1908	June 26, 1933	2 00	8 00	1 00
C. Josephine Biggs	150	Jamaica Bay	7.2	June 26, 1908	June 26, 1933	2 00	14 40	1 80
C. Josephine Biggs	149	Jamaica Bay	1.6	June 26, 1908	June 26, 1933	2 00	3 20	40
C. Josephine Biggs	151	Jamaica Bay	.6	July 6, 1908	July 6, 1933	2 00	1 20	15
Henry Burmester	311	Jamaica Bay	9.2	June 27, 1908	June 27, 1913	25	2 30	2 30
Henry Burmester	29	Jamaica Bay	2.6	Aug. 11, 1908	Aug. 11, 1933	2 00	5 20	65
Henry Burmester	28	Jamaica Bay	2.6	Aug. 11, 1908	Aug. 11, 1933	2 00	5 20	65
Henry Burmester	554	Jamaica Bay	8.6	Aug. 11, 1908	Aug. 11, 1933	2 00	17 20	2 15
Henry Burmester	63	Jamaica Bay	6.2	Aug. 11, 1908	Aug. 11, 1933	2 00	12 40	1 55
Henry Burmester	95	Jamaica Bay	1.2	Aug. 31, 1908	Aug. 31, 1933	2 00	2 40	30
H. W. Behncke	31	Jamaica Bay	2.6	Aug. 23, 1909	Aug. 23, 1934	2 00	5 20	65
Mary R. Behncke	167	Jamaica Bay	5.8	Aug. 23, 1909	Aug. 23, 1934	2 00	11 60	1 45
Wm. C. Baldwin	199	Jamaica Bay	5.4	June 2, 1910	June 2, 1935	2 00	10 80	1 35
Bedell & Ambermann	505	Jamaica Bay	6.2	Feb. 9, 1911	Feb. 9, 1936	2 00	12 40	1 55
J. G. H. Bedell	455	Jamaica Bay	5.4	Feb. 9, 1911	Feb. 9, 1936	2 00	10 80	1 35
C. V. Baldwin	189	Jamaica Bay	2.5	Nov. 10, 1896	Nov. 10, 1911	25	63	63
John M. Bell	269	East Chester Bay	9.6	April 10, 1906	April 10, 1921	25	2 40	2 40
Jacob Brady	249	East Chester Bay	27.6	April 10, 1906	April 10, 1921	25	6 90	6 90
John Bell	258	East Chester Bay	9.2	April 10, 1906	April 10, 1921	25	2 30	2 30
D. B. Colon	950	Raritan Bay	4.8	May 14, 1901	May 14, 1916	50	2 40	1 20
Ernest F. Colon	951	Raritan Bay	9.2	April 14, 1903	May 14, 1918	25	2 30	2 30
Ernest F. Colon	952	Raritan Bay	1.6	May 12, 1903	May 12, 1918	25	40	40
George W. Conklin	996	Raritan Bay	93	Nov. 2, 1911	Nov. 2, 1926	2 00	186 00	23 25

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
James A. Cochrane	997	Raritan Bay	108.4	Nov. 2, 1911	Nov. 2, 1926	$2 00	$216 80	$27 10
James A. Cochrane	986	Raritan Bay	75	Nov. 2, 1911	Nov. 2, 1926	2 00	150 00	18 75
James A. Cochrane	50	Raritan Bay	50	Nov. 2, 1911	Nov. 2, 1926	2 00	100 00	12 50
Selah T. Clock	998	Raritan Bay	100	Nov. 2, 1911	Nov. 2, 1926	2 00	200 00	25 00
Selah T. Clock	988	Raritan Bay	150	Nov. 2, 1911	Nov. 2, 1926	2 00	300 00	37 50
Selah T. Clock	991	Raritan Bay	150	Nov. 2, 1911	Nov. 2, 1926	2 00	300 00	37 50
Nathaniel Carman	492	Jamaica Bay	5.8	Jan. 10, 1899	Jan. 10, 1914	25	1 45	1 45
Nathaniel Carman	116	Jamaica Bay	0.6	Mar. 22, 1910	Mar. 22, 1935	2 00	1 20	15
Nathaniel Carman	115	Jamaica Bay	2.4	Mar. 22, 1910	Mar. 22, 1935	2 00	4 80	60
W. J. Campbell	510	Jamaica Bay	6.2	Nov. 14, 1899	Nov. 14, 1949	25	1 55	1 55
John O. Carlson	605	Jamaica Bay	8.8	Mar. 11, 1902	Mar. 11, 1917	25	2 20	2 20
George A. Carman	118	Jamaica Bay	3.4	Mar. 9, 1910	Mar. 9, 1935	2 00	6 80	85
George A. Carman	218	Jamaica Bay	4.2	Mar. 9, 1910	Mar. 9, 1935	2 00	8 40	1 05
Warren Cornell	453	Jamaica Bay	8.6	Mar. 22, 1910	Mar. 22, 1935	2 00	17 20	2 15
Warren Cornell	449	Jamaica Bay	2.0	Mar. 22, 1910	Mar. 22, 1935	2 00	4 00	50
Warren Cornell	372	Jamaica Bay	5.0	Mar. 22, 1910	Mar. 22, 1935	2 00	10 00	1 25
Cornell & Palmer	369	Jamaica Bay	12.0	Jan. 17, 1911	Jan. 17, 1936	2 00	24 00	3 00
Henry Cornell	409	Jamaica Bay	4.4	April 2, 1910	April 2, 1935	2 00	8 80	1 10
Hiram Cadmus	461	Jamaica Bay	5.4	April 6, 1910	April 6, 1935	2 00	10 80	1 35
Stephen Collins	255	Long Island Sound	6.4	April 8, 1902	April 8, 1917	25	1 60	1 60
Stephen Collins	234	Long Island Sound	7.2	April 8, 1902	April 8, 1917	25	1 80	1 80
Stephen Collins	265	Long Island Sound	2.0	April 8, 1902	April 8, 1917	25	50	50
Bernard Collins	264	Long Island Sound	1.6	April 8, 1902	April 8, 1917	25	40	40
Bernard Collins	233	Long Island Sound	2.8	April 8, 1902	April 8, 1917	25	70	70
Crocker & Allen	Sec. G-93	Long Island Sound	15.5	April 23, 1900	April 23, 1950	25	3 88	3 88
Charles Cowens	Sec. D-93	Long Island Sound	15.8	April 23, 1900	April 23, 1950	25	3 95	3 95
Walter C. Denton	287	Jamaica Bay	11.4	June 9, 1898	June 9, 1913	25	2 85	2 85
Walter C. Denton	344	Jamaica Bay	4.4	May 10, 1898	May 10, 1913	25	1 10	1 10
Charles E. Denton	340	Jamaica Bay	8.2	June 14, 1898	June 14, 1913	25	2 05	2 05
Charles E. Denton	341	Jamaica Bay	5.4	May 10, 1898	May 10, 1913	25	1 35	1 35
Charles E. Denton	153	Jamaica Bay	2.2	Feb. 9, 1911	Feb. 9, 1936	2 00	4 40	55
Charles E. Denton	152	Jamaica Bay	3.2	Feb. 9, 1911	Feb. 9, 1936	2 00	6 40	80
Henry W. Davis	343	Jamaica Bay	10.6	Jan. 11, 1898	Jan. 11, 1913	25	2 65	2 65
Henry W. Davis	506	Jamaica Bay	5.6	Oct. 20, 1909	Oct. 20, 1924	2 00	11 20	1 40
Henry W. Davis	329	Jamaica Bay	7.4	Oct. 20, 1909	Oct. 20, 1924	2 00	14 80	1 85
W. H. Dickens	250	Jamaica Bay	2.8	Aug. 18, 1908	Aug. 18, 1933	2 00	5 60	70
George Dickens	43	Jamaica Bay	3.2	Oct. 18, 1909	Oct. 18, 1934	2 00	6 40	80
Nathaniel E. Davis	626	Jamaica Bay	1.2	Oct. 29, 1909	Oct. 29, 1924	2 00	2 40	30
Nathaniel E. Davis	625	Jamaica Bay	3.2	Oct. 29, 1909	Oct. 29, 1924	2 00	6 40	80

Elizabeth Denice	258	Jamaica Bay	5.4	Nov. 5, 1909	Nov. 5, 1934	2 00	10 80	1 35	
Elizabeth Denice	259	Jamaica Bay	3.6	Nov. 6, 1909	Nov. 6, 1934	2 00	7 20	90	
William Henry Dickens	61	Jamaica Bay	7.8	Oct. 18, 1909	Oct. 18, 1934	2 00	15 60	1 95	
William Henry Dickens	213	Jamaica Bay	5.0	Mar. 14, 1910	Mar. 14, 1935	2 00	10 00	1 25	
George W. Doughty	386	Jamaica Bay	1.8	Mar. 21, 1910	Mar. 21, 1935	2 00	3 60	45	
George W. Doughty	415	Jamaica Bay	4.4	Mar. 21, 1910	Mar. 21, 1935	2 00	8 80	1 10	
George W. Doughty	443	Jamaica Bay	4.8	Mar. 21, 1910	Mar. 21, 1935	2 00	9 60	1 20	
George W. Doughty	383	Jamaica Bay	5.0	Mar. 21, 1910	Mar. 21, 1935	2 00	10 00	1 25	
George W. Doughty	377	Jamaica Bay	2.0	Mar. 21, 1910	Mar. 21, 1935	2 00	4 00	50	
William B. Dooley	457	Jamaica Bay	2.0	Mar. 16, 1911	Mar. 16, 1936	2 00	4 00	50	
William B. Dooley	463	Jamaica Bay	4.0	Mar. 16, 1911	Mar. 16, 1936	2 00	8 00	1 00	
Edward Dooley	459	Jamaica Bay	6.6	Mar. 18, 1911	Mar. 18, 1936	2 00	13 20	1 65	
Dennis Dougherty	286	East Chester Bay	5.8	April 10, 1906	April 10, 1921	2 00	1 45	1 45	
Dennis Dougherty	288	East Chester Bay	10.6	April 10, 1906	April 10, 1921	25	2 65	2 65	
James A. Deveaugh	235	Pelham Bay	12.4	April 8, 1902	April 8, 1917	2 00	3 10	3 10	
D. & H. Oyster Company	Plot D	Long Island Sound	86.0	April 10, 1906	April 10, 1921	25	21 50	21 50	
F. F. Downs	Several	Long Island Sound	40.0	July 12, 1910	July 12, 1925	2 00	80 00	10 00	
F. F. Downs	Several	Long Island Sound	60.0	July 12, 1910	July 12, 1925	2 00	120 00	15 00	
F. F. Downs	Several	Long Island Sound	135.0	Jan. 11, 1911	Jan. 11, 1926	2 00	270 00	33 75	
F. F. Downs	Several	Long Island Sound	25.0	Jan. 11, 1911	Jan. 11, 1926	2 00	50 00	6 25	
F. F. Downs	Several	Long Island Sound	125.0	July 9, 1912	July 9, 1927	2 00	250 00	31 25	
F. F. Downs	Several	Long Island Sound	97.0	July 19, 1912	July 18, 1927	2 00	184 00	24 25	
Frederick Denz	320	Long Island Sound	8.6	Dec. 1, 1910	Dec. 1, 1925	2 00	17 20	2 15	
Richard M. Ellard	318	Long Island Sound	10.0	Dec. 1, 1910	Dec. 1, 1925	2 00	20 00	2 50	
Richard M. Ellard	319	Long Island Sound	4.8	Dec. 1, 1910	Dec. 1, 1925	2 00	9 60	1 20	
John O. Fordham	97	Long Island Sound	66.2	July 25, 1900	July 15, 1915	25	16 55	16 55	
John O. Fordham	305	Long Island Sound	4.6	Dec. 11, 1900	Dec. 11, 1915	25	1 15	1 15	
John O. Fordham	232	Pelham Bay	11.2	June 10, 1902	June 10, 1917	25	2 80	2 80	
John O. Fordham	231	Pelham Bay	5.8	June 10, 1902	June 10, 1917	25	1 45	1 45	
John O. Fordham	229	Pelham Bay	18.2	April 8, 1902	April 8, 1917	25	4 55	4 55	
John O. Fordham	236	Pelham Bay	13.0	Mar. 26, 1909	Mar. 26, 1924	25	3 25	3 25	
William R. Fordham	263	Pelham Bay	1.4	May 13, 1902	May 13, 1917	25	35	35	
William R. Fordham	262	Pelham Bay	6.4	May 13, 1902	May 13, 1917	25	1 60	1 60	
William R. Fordham	261	Pelham Bay	6.2	May 13, 1902	May 13, 1917	25	1 55	1 55	
John J. Ferry	277	Pelham Bay	16.0	April 10, 1906	April 10, 1921	25	4 00	4 00	
John J. Ferry	278	Pelham Bay	4.0	April 10, 1906	April 10, 1921	25	1 00	1 00	
John J. Ferry	279	Pelham Bay	19.4	April 10, 1906	April 10, 1921	25	4 85	4 85	
John J. Ferry	280	Pelham Bay	3.6	April 10, 1906	April 10, 1921	25	90	90	
John J. Ferry	281	Pelham Bay	5.2	April 10, 1906	April 10, 1921	25	1 30	1 30	
Alexander C. Frazer	939	Raritan Bay	.5	July 8, 1902	July 8, 1917	50	25	13	
Alexander C. Frazer	994	Raritan Bay	82.2	July 25, 1911	July 25, 1926	2 00	164 40	20 55	
John T. Ford	289	Jamaica Bay	4.6	June 14, 1898	June 14, 1913	25	1 15	1 15	
Joseph Flaherty	217	Jamaica Bay	5.4	April 13, 1897	April 13, 1912	25	1 35	1 35	
Jacob Frederick	566	Jamaica Bay	22.2	June 11, 1901	June 11, 1916	25	5 55	5 55	
W. S. Ford	179	Jamaica Bay	4.4	Mar. 18, 1910	Mar. 18, 1935	2 00	8 80	1 10	
John Frederick	458	Jamaica Bay	7.6	April 8, 1910	April 8, 1935	2 00	15 20	1 90	
Glenwood Oyster Company	609	Jamaica Bay	12.6	Mar. 11, 1902	Mar. 11, 1917	25	3 15	3 15	
Charles Gateson	597	Jamaica Bay	13.6	Aug. 12, 1902	Aug. 12, 1917	25	3 40	3 40	

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
Josephine Geffken	4	Jamaica Bay	1.4	June 26, 1908	June 26, 1933	$2 00	$2 80	$0 35
Josephine Geffken	5	Jamaica Bay	1.8	June 26, 1908	June 26, 1933	2 00	3 60	45
Albert Geffken	557	Jamaica Bay	.8	Sept. 11, 1908	Sept. 11, 1933	2 00	1 60	20
Albert Geffken	2	Jamaica Bay	1.0	Sept. 11, 1908	Sept. 11, 1933	2 00	2 00	25
Glenwood Oyster Company	80	Long Island Sound	159.4	Mar. 13, 1900	Mar. 13, 1915	25	39 85	39 85
Glenwood Oyster Company	109	Long Island Sound	29.4	Dec. 10, 1901	Dec. 10, 1916	25	7 35	7 35
Glenwood Oyster Company	120	Long Island Sound	15.8	Dec. 10, 1901	Dec. 10, 1916	25	3 95	3 95
E. M. Gunn	96	Long Island Sound	5.2	June 19, 1900	June 19, 1915	25	1 30	1 30
Howard Gould	117	Long Island Sound	106.0	Aug. 12, 1902	Aug. 12, 1917	25	26 50	26 50
Howard Gould	118	Long Island Sound	25.6	Aug. 12, 1902	Aug. 12, 1917	25	6 40	6 40
Joseph Glasier	248	Long Island Sound	1.8	Mar. 11, 1902	Mar. 11, 1917	25	45	45
Jesse V. Golden	17	Long Island Sound	2.2	Dec. 14, 1910	Dec. 14, 1925	2 00	4 40	55
F. C. Glasier	245	East Chester Bay	23.6	April 10, 1906	April 10, 1921	25	5 90	5 90
F. C. Glasier	309	East Chester Bay	6.2	Nov. 11, 1909	Nov. 11, 1934	2 00	12 40	1 55
F. C. & H. A. Glasier	246	East Chester Bay	2.2	May 13, 1902	May 13, 1917	25	55	55
F. C. & H. A. Glasier	237	East Chester Bay	16.6	May 13, 1902	May 13, 1917	25	4 15	4 15
William H. Houghwout	899	Raritan Bay	4.2	April 12, 1909	April 12, 1934	2 00	8 40	1 05
William H. Houghwout	978	Raritan Bay	5.0	Sept. 21, 1910	Sept. 21, 1925	25	1 25	1 25
Haviland & Odell	368	Jamaica Bay	4.6	Aug. 15, 1898	Aug. 15, 1913	25	1 15	1 15
Haviland & Odell	465	Jamaica Bay	3.6	Aug. 15, 1898	Aug. 15, 1913	25	90	90
Joseph Harris	219	Jamaica Bay	6.8	June 8, 1897	June 8, 1912	25	1 70	1 70
Robert W. Hoyt	334	Jamaica Bay	1.0	June 27, 1898	June 27, 1913	25	25	25
George H. Hicks	376	Jamaica Bay	2.0	July 18, 1898	July 18, 1913	25	50	50
George H. Hicks	378	Jamaica Bay	3.2	July 18, 1898	July 18, 1913	25	80	80
George H. Hicks	407	Jamaica Bay	7.8	July 18, 1898	July 18, 1913	25	1 95	1 95
P. W. Hussmann	206	Jamaica Bay	.8	Feb. 9, 1897	Feb. 9, 1912	25	20	20
P. W. Hussmann	42	Jamaica Bay	1.2	Oct. 18, 1909	Oct. 18, 1934	2 00	2 40	30
P. W. Hussmann	24	Jamaica Bay	1.8	Oct. 18, 1909	Oct. 18, 1934	2 00	3 60	45
A. A. Haack	108	Jamaica Bay	4.2	Aug. 31, 1908	Aug. 31, 1933	2 00	5 20	1 05
A. A. Haack	309	Jamaica Bay	13.2	Aug. 31, 1908	Aug. 31, 1933	2 00	26 40	3 30
A. A. Haack	7	Jamaica Bay	2.2	Aug. 31, 1908	Aug. 31, 1933	2 00	4 40	55
A. A. Haack	12½	Jamaica Bay	1.8	Mar. 14, 1910	Mar. 14, 1935	2 00	3 60	45
William J. Hewitt	539	Jamaica Bay	8.4	Oct. 20, 1909	Oct. 20, 1924	2 00	6 80	2 10
Jarvis Hicks	629	Jamaica Bay	.4	Oct. 29, 1909	Oct. 29, 1924	2 00	80	10
Jarvis Hicks	630	Jamaica Bay	1.2	Oct. 29, 1909	Oct. 29, 1924	2 00	2 40	30
John Hansen	34	Jamaica Bay	2.8	Aug. 31, 1908	Aug. 31, 1933	2 00	5 60	70
John Hansen	69	Jamaica Bay	20.2	Aug. 31, 1908	Aug. 31, 1933	2 00	40 40	5 05
John Hansen	71	Jamaica Bay	2.8	Aug. 31, 1908	Aug. 31, 1933	2 00	5 60	70
John Hansen	307	Jamaica Bay	10.2	Nov. 28, 1908	Nov. 28, 1933	2 00	20 40	2 55

E. Otis Hovey	600	Jamaica Bay	42.8	May 9, 1910	May 9, 1935	2 00	85 60	10	70
E. Otis Hovey	587	Jamaica Bay	11.0	May 9, 1910	May 9, 1935	2 00	22 00	2	75
E. Otis Hovey	617	Jamaica Bay	5.6	May 9, 1910	May 9, 1935	2 00	11 20	1	40
E. Otis Hovey	198	Jamaica Bay	41.6	May 9, 1910	May 9, 1935	2 00	83 20	10	40
E. Otis Hovey	227	Jamaica Bay	3.0	May 9, 1910	May 9, 1935	2 00	6 00		75
E. Otis Hovey	301	Jamaica Bay	14.8	May 9, 1910	May 9, 1935	2 00	29 60	3	70
E. Otis Hovey	618	Jamaica Bay	17.0	May 9, 1910	May 9, 1935	2 00	34 00	4	25
Christian Hoobs	619	Jamaica Bay	3.6	Dec. 29, 1908	Dec. 29, 1923	2 00	7 20		90
Daniel Huffmire	264	Jamaica Bay	1.6	Oct. 18, 1909	Oct. 19, 1934	2 00	3 20		40
L. L. Huffmire	262	Jamaica Bay	12.4	Oct. 18, 1909	Oct. 19, 1934	2 00	20 80	3	10
L. L. Huffmire	265	Jamaica Bay	1.4	Oct. 18, 1909	Oct. 19, 1934	2 00	2 80		35
L. L. Huffmire	263	Jamaica Bay	5.4	Oct. 18, 1909	Oct. 19, 1934	2 00	10 80	1	35
Winant Huffmire	355	Jamaica Bay	7.2	Oct. 18, 1909	Oct. 19, 1934	2 00	14 40	1	80
Winant Huffmire	495	Jamaica Bay	3.0	Oct. 18, 1909	Oct. 19, 1934	2 00	6 00		75
Winant Huffmire	562	Jamaica Bay	5.6	Oct. 18, 1909	Oct. 9, 1934	2 00	11 20	1	40
Housman & Weber	324	Long Island Sound	100.0	July 29, 1911	July 29, 1926	2 00	200 00	25	00
David L. Jones	315	Jamaica Bay	3.4	Feb. 8, 1898	Feb. 8, 1913	25	85		85
David L. Jones	17	Jamaica Bay	3.8	June 16, 1908	June 16, 1933	2 00	7 60		95
George H. Johnson	243	Jamaica Bay	4.2	June 8, 1897	June 8, 1912	25	1 05	1	05
George H. Johnson	94	Jamaica Bay	1.8	Sept. 11, 1908	Sept. 11, 1933	2 00	3 60		45
Jane Johnson	132	Jamaica Bay	5.0	Sept. 11, 1908	Sept. 11, 1933	2 00	10 00	1	25
Arthur Johnson	588	Jamaica Bay	4.0	Feb. 13, 1901	Feb. 13, 1916	25	1 00	1	00
Richard Johnson	91	Jamaica Bay	3.2	June 26, 1908	June 26, 1933	2 00	6 40		80
Richard Johnson	92	Jamaica Bay	1.8	June 26, 1908	June 26, 1933	2 00	3 60		45
Mary Johnson	96	Jamaica Bay	3.0	June 26, 1908	June 26, 1933	2 00	6 00		75
Harry C. Johnson	620	Jamaica Bay	1.6	Dec. 29, 1908	Dec. 29, 1923	2 00	3 20		40
Harry C. Johnson	439	Jamaica Bay	3.0	Mar. 22, 1910	Mar. 22, 1935	2 00	6 00		75
Harry C. Johnson	361	Jamaica Bay	2.0	Mar. 22, 1910	Mar. 22, 1935	2 00	4 00		50
Harry C. Johnson	431	Jamaica Bay	2.0	Mar. 22, 1910	Mar. 22, 1935	2 00	4 00		50
Alfred Jones	92	Long Island Sound	25.0	April 10, 1900	April 10, 1950	25	6 25	6	25
Lucius C. Jones	104	Long Island Sound	25.2	Nov. 13, 1900	Nov. 13, 1915	25	6 30	6	30
Adolph Johnson	Plot C	Long Island Sound	88.7	April 10, 1906	April 10, 1921	25	22 18	22	18
A. M. Kemp	308	Long Island Sound	4.4	Jan. 8, 1909	Jan. 8, 1924	2 00	8 80	1	10
Ludwig Klee	70	Jamaica Bay	1.6	July 20, 1908	July 20, 1933	2 00	3 20		40
Ludwig Klee	208	Jamaica Bay	.4	Jan. 4, 1909	Jan. 4, 1934	2 00	80		10
Robert L. Kind	245	Jamaica Bay	3.8	June 8, 1897	June 8, 1912	25	95		95
William H. Lockwood	920	Raritan Bay	7.2	Aug. 9, 1898	Aug. 9, 1913	25	1 80	1	80
William H. Lockwood	925	Raritan Bay	3.8	June 13, 1899	June 13, 1914	25	95		95
William H. Lockwood	927	Raritan Bay	155.2	Mar. 13, 1900	Mar. 13, 1915	25	38 80	38	80
William H. Lockwood	944	Raritan Bay	36.0	Dec. 9, 1892	Dec. 9, 1917	25	9 00	9	00
William H. Lockwood	945	Raritan Bay	39.4	May 12, 1903	May 12, 1918	25	9 85	9	85
R. W. LaForge	961	Raritan Bay	1.0	Dec. 10, 1901	Dec. 10, 1916	25	25		25
R. W. LaForge	976	Raritan Bay	10.0	June 6, 1910	June 6, 1925	2 00	20 00	2	50
R. W. & W. W. LaForge	462	Raritan Bay	1.2	Nov. 10, 1909	Nov. 10, 1924	2 00	2 40		30
Fred Lundy	322	Long Island Sound	21.0	Nov. 23, 1910	Nov. 23, 1925	2 00	42 00	5	25
Lowndes & Mills	79	Long Island Sound	119.6	Sept. 11, 1912	Sept. 11, 1927	2 00	239 20	29	90
Lowndes & Mills	Sec B-93	Long Island Sound	24.4	April 23, 1900	April 23, 1950	25	6 10	6	10
Lowndes & Mills	106	Long Island Sound	40.6	Nov. 12, 1901	Nov. 12, 1916	25	10 15	10	15

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
Charles B. Leviness	238	Long Island Sound	3.6	Feb. 11, 1902	Feb. 11, 1917	$0 25	$0 90	$0 90
Lewis Brothers	299	Long Island Sound	20.6	Sept. 11, 1900	Sept. 11, 1915	25	5 15	5 15
Lewis Brothers	300	Long Island Sound	84.2	Sept. 11, 1900	Sept. 11, 1915	25	21 05	21 05
Lowndes, Mills & Thorne	16	Hempstead Harbor	10.6	Dec. 14, 1910	Dec. 14, 1925	2 00	21 20	2 65
Lowndes, Mills & Thorne	2	Hempstead Harbor	4.0	Dec. 14, 1910	Dec. 14, 1925	2 00	8 00	1 00
Lowndes, Mills & Thorne	18	Hempstead Harbor	22.2	Dec. 14, 1910	Dec. 14, 1925	2 00	44 40	5 55
Lowndes, Mills & Thorne	1	Hempstead Harbor	4.4	Dec. 14, 1910	Dec. 14, 1925	2 00	8 80	1 10
Lowndes, Mills & Ockers	15	Hempstead Harbor	1.0	Dec. 14, 1910	Dec. 14, 1925	2 00	2 00	25
Lars Larsen	8	Hempstead Harbor	.6	Dec. 14, 1910	Dec. 14, 1925	2 00	1 20	15
Lars Larsen	11	Hempstead Harbor	2.0	Dec. 14, 1910	Dec. 14, 1925	2 00	4 00	50
Lars Larsen	13	Hempstead Harbor	1.2	Dec. 14, 1910	Dec. 14, 1925	2 00	2 40	30
Cornelius Leary	12	Hempstead Harbor	2.2	Dec. 14, 1910	Dec. 14, 1925	2 00	4 40	55
Charles E. Leviness	230	East Chester Bay	2.0	April 10, 1906	April 10, 1921	25	50	50
Robert Lee	250	East Chester Bay	9.2	April 10, 1906	April 10, 1921	25	2 30	2 30
Robert Lee	257	East Chester Bay	15.6	April 10, 1906	April 10, 1921	25	3 90	3 90
Azel F. Merrill	126	Long Island Sound	33.6	July 13, 1909	July 13, 1924	2 00	67 20	8 40
Azel F. Merrill	312	Long Island Sound	159.4	July 13, 1909	July 13, 1924	2 00	318 80	39 85
Azel F. Merrill	313	Long Island Sound	126.0	July 13, 1909	July 13, 1924	2 00	252 00	31 50
Azel F. Merrill	316	Long Island Sound	57.0	May 10, 1910	May 10, 1925	2 00	114 00	14 25
Rudolph Merrill	311	Long Island Sound	108.0	July 14, 1908	July 14, 1923	2 00	216 00	27 00
Henry E. Mackey	Sec E-93	Long Island Sound	14.1	April 23, 1900	April 23, 1950	25	3 52	3 52
E. H. Mackey	Sec C-93	Long Island Sound	27.0	April 23, 1900	April 23, 1950	25	6 75	6 75
E. H. Mackey	90	Long Island Sound	34.0	April 10, 1900	April 10, 1950	25	8 50	8 50
E. H. Mackey	Sec. A-121	Long Island Sound	25.2	June 14, 1904	June 14, 1919	25	6 30	6 30
Benjamin Merritt	301	Long Island Sound	.8	Mar. 11, 1902	Mar. 11, 1917	25	20	20
Benjamin Merritt	302	Long Island Sound	1.0	Mar. 11, 1902	Mar. 11, 1917	25	25	25
Benjamin Merritt	303	Long Island Sound	1.4	Mar. 11, 1902	Mar. 11, 1917	25	35	35
Benjamin Merritt	325	East Chester Bay	8.0	June 13, 1911	June 13, 1926	2 00	16 00	2 00
Azel F. Merrell	974	Raritan Bay	1.0	Jan. 6, 1909	Jan. 6, 1924	2 00	2 00	25
Azel F. Merrell	982	Raritan Bay	45.8	Nov. 23, 1910	Nov. 23, 1925	2 00	91 60	11 45
Merrill & Burbank	933	Raritan Bay	44.4	Sept. 20, 1910	Sept. 20, 1925	2 00	88 80	11 10
Merrill & Burbank	928B	Raritan Bay	25.0	Sept. 20, 1910	Sept. 20, 1925	2 00	50 00	6 25
L. B. Morey	940	Raritan Bay	1.7	July 8, 1902	July 8, 1917	25	43	43
John D. Merrell	919	Raritan Bay	14.4	Aug. 15, 1898	Aug. 15, 1913	25	3 60	3 60
Henry S. Marshall	761	Raritan Bay	3.0	Dec. 8, 1893	Dec. 8, 1915	25	75	75
Henry S. Marshall	764	Raritan Bay	3.0	Dec. 8, 1893	Dec. 8, 1915	25	75	75
Azel F. Merrell	20	Jamaica Bay	5.4	Mar. 14, 1910	Mar. 14, 1925	2 00	10 80	1 35
Azel F. Merrell	19	Jamaica Bay	2.8	Mar. 14, 1910	Mar. 14, 1925	2 00	5 60	70
Azel F. Merrell	3	Jamaica Bay	3.8	Mar. 14, 1910	Mar. 14, 1925	2 00	7 60	95

Azel F. Merrell	9	Jamaica Bay	9.4	Mar. 14, 1910	Mar. 14 ,1925	2 00	18 80	35
Azel F. Merrell	146	Jamaica Bay	4.2	Mar. 14, 1910	Mar. 14, 1925	2 00	8 40	1 05
Azel F. Merrell	200	Jamaica Bay	7.2	Mar. 14, 1910	Mar. 14, 1925	2 00	14 40	1 80
Azel F. Merrell	391	Jamaica Bay	2.0	Mar. 14, 1910	Mar. 14, 1925	2 00	4 00	50
Azel F. Merrell	392	Jamaica Bay	1.6	Mar. 14, 1910	Mar. 14, 1925	2 00	3 20	40
Azel F. Merrell	535	Jamaica Bay	4.2	Mar. 14, 1910	Mar. 14, 1925	2 00	8 40	1 05
Azel F. Merrell	488	Jamaica Bay	6.8	Mar. 14, 1910	Mar. 14, 1925	2 00	13 60	1 70
Azel F. Merrell	395	Jamaica Bay	2.0	July 18, 1898	July 8, 1913	25	50	50
George H. Mott	403	Jamaica Bay	.4	Dec. 13, 1898	Dec. 13, 1913	25	10	10
George H. Mott	408	Jamaica Bay	8.8	Aug. 15, 1898	Aug. 15, 1913	25	2 20	2 20
George H. Mott	424	Jamaica Bay	2.4	Aug. 15, 1898	Aug. 15, 1913	25	60	60
George H. Mott	430	Jamaica Bay	21.6	Sept. 23, 1898	Sept. 13, 1913	25	5 40	5 40
George H. Mott	507	Jamaica Bay	3.4	Oct. 10, 1899	Oct. 10, 1949	25	85	85
Wm. H. Morrison	551	Jamaica Bay	1.2	Aug. 13, 1901	Aug. 13, 1916	25	30	30
Wm. H. Morrison	159	Jamaica Bay	5.6	May 11, 1910	May 11, 1925	2 00	11 20	1 40
Wm. H. Morrison	345A	Jamaica Bay	3.4	May 10, 1910	May 10, 1925	2 00	6 80	85
Peter Miller	16	Jamaica Bay	4.8	Feb. 4, 1909	Feb. 4, 1924	2 00	9 60	1 20
Peter Miller	1	Jamaica Bay	3.8	Feb. 4, 1909	Feb. 4, 1924	2 00	7 50	95
Ferdinand Moller	87	Jamaica Bay	2.0	Aug. 31, 1908	Aug. 31, 1923	2 00	4 00	50
Ferdinand Moller	86	Jamaica Bay	1.8	Aug. 31, 1908	Aug. 31, 1923	2 00	3 60	45
Ferdinand Moller	72	Jamaica Bay	2.4	Aug. 31, 1908	Aug. 31, 1923	2 00	4 80	60
Ferdinand Moller	530	Jamaica Bay	3.4	Aug. 31, 1908	Aug. 31, 1923	2 00	6 80	85
Ferdinand Moller	297	Jamaica Bay	2.0	Aug. 31, 1908	Aug. 31, 1923	2 00	4 00	50
Ferdinand Moller	296	Jamaica Bay	2.4	Aug. 31, 1908	Aug. 31, 1923	2 00	4 80	60
Ferdinand Moller	6	Jamaica Bay	2.6	Aug. 31, 1908	Aug. 31, 1933	2 00	5 20	65
George S. Monroe	474	Jamaica Bay	14.0	May 9, 1910	May 9, 1925	2 00	28 00	3 50
Monroe & Remsen	464	Jamaica Bay	6.0	May 9, 1910	May 9, 1935	2 00	12 00	1 50
Merrell & Bayles	3	Hempstead Harbor	5.6	Dec. 14, 1910	Dec. 14, 1925	2 00	11 20	1 40
Merrell & Bayles	5	Hempstead Harbor	19.0	Dec. 14, 1910	Dec. 14, 1925	2 00	38 00	4 75
Wm. J. Mills	4	Hempstead Harbor	1.0	May 17, 1911	May 17, 1926	2 00	2 00	25
Robert R. Mott	6	Hempstead Harbor	1.4	Dec. 14, 1910	Dec. 14, 1925	2 00	2 80	35
Timothy T. Mott	7	Hempstead Harbor	1.2	Dec. 14, 1910	Dec. 14, 1925	2 00	2 40	30
Mills & Ronik	Plot A	Long Island Sound	258.0	April 10, 1906	April 10, 1921	25	64 50	64 50
Mills & Ronik	Several	Long Island Sound	75.0	July 13, 1909	July 13, 1934	2 00	150 00	18 75
Wm. J. Mills	314	Long Island Sound	20.0	Sept. 13, 1909	Sept. 13, 1924	2 00	40 00	5 00
Wm. J. Mills	Several	Long Island Sound	115.0	July 13, 1909	July 13, 1924	2 00	130 00	28 75
Wm. J. Mills	Several	Long Island Sound	110.0	July 13, 1909	July 13, 1924	2 00	220 00	27 50
Wm. J. Mills	321	Long Island Sound	40.0	Dec. 1, 1910	Dec. 1, 1925	2 00	80 00	10 00
Wm. J. Mills	Several	Long Island Sound	294.0	July 3, 1911	July 3, 1926	2 00	588 00	73 50
Matinecock Oyster Company	114	Long Island Sound	24.2	Dec. 10, 1901	Dec. 10, 1916	25	6 05	6 05
Matinecock Oyster Company	81	Long Island Sound	38.4	Dec. 10, 1901	Dec. 10, 1916	25	9 60	9 60
Matinecock Oyster Company	73A	Long Island Sound	200.0	Oct. 7, 1908	Oct. 7, 1923	2 00	400 00	50 00
Mattituck Oyster Company	Several	Long Island Sound	280.0	April 27, 1909	April 27, 1924	2 00	560 00	70 00
Mattituck Oyster Company	Several	Long Island Sound	120.0	April 27, 1909	April 27, 1924	2 00	240 00	30 00
Mattituck Oyster Company	Several	Long Island Sound	60.0	Sept. 29, 1909	Sept. 29, 1924	2 00	120 00	15 00
Mattituck Oyster Company	Several	Long Island Sound	17.4	Sept. 29, 1909	Sept. 29, 1924	2 00	34 80	4 35
Mattituck Oyster Company	Several	Long Island Sound	45.0	Nov. 10, 1909	Nov. 10, 1924	2 00	90 00	11 25
Mattituck Oyster Company	Several	Long Island Sound	35.0	Nov. 11, 1910	Nov. 11, 1925	2 00	70 00	8 75

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
Wm. H. Morris	276	East Chester Bay	2.6	Aug. 26, 1912	Aug. 26, 1927	$2 00	$5 20	$0 65
Charles McCrodden	221	Jamaica Bay	9.4	Oct. 12, 1897	Oct. 12, 1912	25	2 35	2 35
Charles McCrodden	606	Jamaica Bay	9.0	April 8, 1902	April 8, 1917	25	2 25	2 25
John H. McCrodden	517	Jamaica Bay	4.6	Dec. 12, 1899	Dec. 12, 1914	25	1 15	1 15
James H. McCrodden	22	Jamaica Bay	4.0	Mar. 18, 1910	Mar. 18, 1935	2 00	8 00	1 00
Clara McCrodden	23	Jamaica Bay	2.6	Mar. 18, 1910	Mar. 18, 1935	2 00	5 20	65
W. J. McGrory	285	East Chester Bay	41.2	April 10, 1906	April 10, 1921	25	10 30	10 30
New York Oyster Company	918	Raritan Bay	12.8	Oct. 29, 1912	Oct. 29, 1927	2 00	25 60	3 20
New York Oyster Company	916	Raritan Bay	44.2	Oct. 29, 1912	Oct. 29, 1927	2 00	88 40	11 05
New York Oyster Company	930	Raritan Bay	49.8	Oct. 10, 1899	Oct. 10, 1914	25	12 45	12 45
New York Oyster Company	932	Raritan Bay	11.2	Mar. 9, 1901	Mar. 9, 1916	25	2 80	2 80
New York Oyster Company	941	Raritan Bay	4.8	Dec. 10, 1901	Dec. 10, 1916	25	1 20	1 20
New York Oyster Company	942	Raritan Bay	13.8	Aug. 12, 1902	Aug. 12, 1917	25	3 45	3 45
New York Oyster Company	943	Raritan Bay	50.2	Nov. 9, 1902	Nov. 9, 1917	25	12 55	12 55
New York Oyster Company	955	Raritan Bay	42.8	June 9, 1903	June 9, 1918	25	10 70	10 70
New York Oyster Company	957	Raritan Bay	3.0	Jan. 10, 1904	Jan. 10, 1914	25	75	75
New York Oyster Company	958	Raritan Bay	95.6	Jan. 12, 1904	Jan. 12, 1919	25	23 90	23 90
New York Oyster Company	959	Raritan Bay	10.0	Nov. 9, 1904	Nov. 9, 1914	25	2 50	2 50
New York Oyster Company	962	Raritan Bay	1.0	May 10, 1904	May 10, 1919	25	25	25
New York Oyster Company	967	Raritan Bay	67.0	Aug. 8, 1905	Aug. 8, 1920	30	20 10	16 75
New York Oyster Company	968	Raritan Bay	7.4	Dec. 12, 1905	Dec. 12, 1920	1 00	7 40	1 85
New York Oyster Company	970	Raritan Bay	8.4	July 14, 1903	July 14, 1918	25	2 10	2 10
New York Oyster Company	969	Raritan Bay	1.6	Oct. 14, 1902	Oct. 14, 1917	25	40	40
New York Oyster Company	975	Raritan Bay	32.0	Mar. 8, 1910	Mar. 8, 1925	2 00	64 00	8 00
New York Oyster Company	983	Raritan Bay	8.6	Jan. 10, 1911	Jan. 10, 1926	2 00	17 20	2 15
New York Oyster Company	987	Raritan Bay	100.0	Jan. 10, 1911	Jan. 10, 1926	2 00	200 00	25 00
New York Oyster Company	466	Jamaica Bay	17.8	July 18, 1898	July 18, 1913	25	4 45	4 45
New York Oyster Company	478	Jamaica Bay	2.8	Oct. 11, 1898	Oct. 11, 1913	25	70	70
New York Oyster Company	540	Jamaica Bay	13.4	Jan. 9, 1900	Jan. 9, 1915	25	3 35	3 35
New York Oyster Company	1	Hudson River	695.6	June 14, 1904	June 14, 1914	25	173 90	173 90
New York Oyster Company	3	Hudson River	67.6	June 9, 1903	June 9, 1924	2 00	135 20	16 90
New York Oyster Company	4	Hudson River	6.6	Sept. 8, 1898	Sept. 8, 1923	2 00	13 20	1 65
New York Oyster Company	2	Hudson River	167.0	July 14, 1908	July 14, 1923	2 00	334 00	41 75
Wm. Oelrich	303	Jamaica Bay	3.0	June 27, 1898	June 27, 1913	25	75	75
Wm. Oelrich	67	Jamaica Bay	3.8	Aug. 11, 1908	Aug. 11, 1933	2 00	7 60	95
Wm. Oelrich	65	Jamaica Bay	2.0	Aug. 11, 1908	Aug. 11, 1933	2 00	4 00	50
Wm. Oelrich	302	Jamaica Bay	10.0	Aug. 11, 1908	Aug. 11, 1933	2 00	20 40	2 50
Anna Oelrich	66	Jamaica Bay	5.2	Aug. 11, 1908	Aug. 11, 1933	2 00	10 40	1 30
Charles Olsen	9	Hempstead Harbor	2.2	Dec. 14, 1910	Dec. 14, 1925	2 00	4 40	55

Oyster Bay Oyster Company	Several	Long Island Sound	145.0	July 13, 1909	July 13, 1924	2 00	290 00	36 25
Oyster Bay Oyster Company	Several	Long Island Sound	130.0	July 13, 1909	July 13, 1924	2 00	260 00	32 50
Pausch Brothers	107	Long Island Sound	116.6	Feb. 11, 1902	Feb. 11, 1917	25	29 15	29 15
Pausch Brothers	108	Long Island Sound	25.0	May 13, 1902	May 13, 1917	25	6 25	6 25
Pausch Brothers	Several	Long Island Sound	150.0	May 10, 1904	May 10, 1919	25	37 50	37 50
Pausch Brothers	Section B	Long Island Sound	62.5	June 14, 1904	June 14, 1919	25	15 63	15 63
Pausch Brothers	Several	Long Island Sound	98.2	May 10, 1904	May 10, 1919	25	24 55	24 55
Pausch Brothers	127	Long Island Sound	17.6	Jan. 9, 1906	Jan. 9, 1921	25	4 40	4 40
Pausch Brothers	315	Long Island Sound	35.6	Mar. 9, 1910	Mar. 9, 1925	2 00	71 20	8 90
Pausch Brothers	977	Raritan Bay	144.0	June 6, 1910	June 6, 1925	2 00	238 00	36 00
Polworth & Elsworth	934	Raritan Bay	2.2	Dec. 10, 1901	Dec. 10, 1916	25	55	55
Polworth & Elsworth	935	Raritan Bay	9.2	Dec. 10, 1901	Dec. 10, 1916	25	2 30	2 30
Polworth & Elsworth	971	Raritan Bay	54.0	Dec. 8, 1903	Dec. 8, 1918	25	13 50	13 50
Polworth & Elsworth	965	Raritan Bay	18.0	Dec. 8, 1903	Dec. 8, 1918	25	4 50	4 50
Polworth & Elsworth	915	Raritan Bay	45.8	Oct. 12, 1897	Oct. 12, 1912	25	11 45	11 45
Polworth & Elsworth	917	Raritan Bay	11.4	Jan. 11, 1898	Jan. 11, 1913	25	2 85	2 85
Polworth & Elsworth	931	Raritan Bay	12.5	Mar. 19, 1901	Mar. 19, 1916	25	3 12	3 12
Elmer I. Palmer	897	Raritan Bay	32.8	April 10, 1906	April 10, 1921	25	8 20	8 20
Elmer I. Palmer	896	Raritan Bay	15.0	April 10, 1906	April 10, 1921	25	3 75	3 75
Elmer I. Palmer	973	Raritan Bay	32.0	Feb. 13, 1906	Feb. 13, 1921	25	8 00	8 00
Pausch Brothers Oyster Company	990	Raritan Bay	100.0	Sept. 28, 1911	Sept. 28, 1926	2 00	200 00	25 00
Pausch Brothers Oyster Company	989	Raritan Bay	200.0	Sept. 28, 1911	Sept. 28, 1926	2 00	400 00	50 00
Carl Peers	216	Jamaica Bay	2.0	June 8, 1897	June 8, 1912	25	50	50
Carl Peers	308	Jamaica Bay	7.6	Aug. 9, 1898	Aug. 9, 1913	25	1 90	1 90
Carl Peers	133	Jamaica Bay	3.8	June 18, 1908	June 18, 1923	2 00	7 60	95
Carl Peers	215	Jamaica Bay	2.8	June 18, 1908	June 18, 1923	2 00	5 60	70
Charles L. Pearsall	414	Jamaica Bay	3.8	Mar. 23, 1910	Mar. 23, 1935	2 00	7 60	95
Charles L. Pearsall	421	Jamaica Bay	15.6	June 23, 1910	June 23, 1935	2 00	31 20	3 90
Thomas Pearsall	549	Jamaica Bay	2.6	June 11, 1901	June 11, 1916	25	65	65
Thomas Pearsall	621	Jamaica Bay	3.2	Dec. 29, 1908	Dec. 29, 1923	2 00	6 40	80
Thomas Pearsall	419	Jamaica Bay	3.4	Mar. 22, 1910	Mar. 22, 1935	2 00	6 80	85
Thomas Pearsall	448	Jamaica Bay	1.8	Mar. 22, 1910	Mar. 22, 1935	2 00	3 60	45
Thomas Pearsall	423	Jamaica Bay	4.6	Mar. 22, 1910	Mar. 22, 1935	2 00	9 20	1 15
John Price, Jr.	244	East Chester Bay	24.8	April 10, 1906	April 10, 1921	25	6 20	6 20
Elmer I. Palmer	Sec. B	Long Island Sound	62.5	Sept. 13, 1904	Sept. 13, 1919	25	15 63	15 63
John Quigley	8	Jamaica Bay	3.6	Mar. 29, 1910	Mar. 29, 1935	2 00	7 20	90
Henry C. Quaritus	514	Jamaica Bay	9.8	Nov. 14, 1899	Nov. 14, 1914	25	2 45	2 45
Henry C. Quaritus	515	Jamaica Bay	2.4	Nov. 14, 1899	Nov. 14, 1914	25	60	60
Rockaway Oyster Company	228	Jamaica Bay	4.2	June 8, 1897	June 8, 1912	25	1 05	1 05
Rockaway Oyster Company	224	Jamaica Bay	2.0	Jan. 12, 1897	Jan. 12, 1912	25	50	50
Rockaway Oyster Company	282	Jamaica Bay	7.6	June 8, 1897	June 8, 1912	25	1 90	1 90
Rockaway Oyster Company	347	Jamaica Bay	19.8	Jan. 11, 1898	Jan. 11, 1913	25	4 95	4 95
Rockaway Oyster Company	480	Jamaica Bay	3.4	Sept. 13, 1898	Sept. 13, 1913	25	85	85
Rockaway Oyster Company	481	Jamaica Bay	3.2	Oct. 11, 1898	Oct. 11, 1913	25	80	80
Rockaway Oyster Company	487	Jamaica Bay	7.8	Jan. 10, 1899	Jan. 10, 1914	25	1 95	1 95
Rockaway Oyster Company	516	Jamaica Bay	7.2	Dec. 12, 1899	Dec. 12, 1949	25	1 80	1 80
Rockaway Oyster Company	564	Jamaica Bay	5.2	May 14, 1901	May 14, 1916	25	1 30	1 30
Rockaway Oyster Company	135	Jamaica Bay	4.2	June 16, 1908	June 16, 1933	2 00	8 40	1 05

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annua ltax
Rockaway Oyster Company	158	Jamaica Bay	6.6	June 27, 1908	June 27, 1933	$2 00	$13 20	$1 55
Rockaway Oyster Company	84	Jamaica Bay	3.0	July 22, 1908	July 22, 1933	2 00	6 00	75
Rockaway Oyster Company	332	Jamaica Bay	5.8	July 22, 1908	July 22, 1933	2 00	11 60	1 45
Rockaway Oyster Company	85	Jamaica Bay	1.8	July 22, 1908	July 22, 1933	2 00	3 60	45
Rockaway Oyster Company	80	Jamaica Bay	4.4	July 22, 1908	July 22, 1933	2 00	8 80	1 10
Rockaway Oyster Company	79	Jamaica Bay	1.8	Aug. 11, 1908	Aug. 11, 1933	2 00	3 60	45
Rockaway Oyster Company	622	Jamaica Bay	11.6	Dec. 29, 1908	Dec. 29, 1923	2 00	23 20	2 90
Rockaway Oyster Company	83	Jamaica Bay	5.0	Mar. 9, 1910	Mar. 9, 1935	2 00	10 00	1 25
Rockaway Oyster Company	229	Jamaica Bay	10.4	Mar. 9, 1910	Mar. 9, 1935	2 00	20 80	2 60
Rockaway Oyster Company	82	Jamaica Bay	5.8	Mar. 9, 1910	Mar. 9, 1935	2 00	11 60	1 45
Rockaway Oyster Company	136	Jamaica Bay	4.0	June 2, 1910	June 2, 1935	2 00	8 00	1 00
Rockaway Oyster Company	190	Jamaica Bay	6.2	Aug. 11, 1906	Aug. 11, 1911	25	1 55	1 55
Willett E. Raynor	561	Jamaica Bay	8.0	Aug. 13, 1901	Aug. 13, 1916	25	2 00	2 00
Willett E. Raynor	260	Jamaica Bay	2.8	Oct. 1, 1909	Oct. 1, 1934	2 00	5 60	70
Willett E. Raynor	257	Jamaica Bay	4.8	Oct. 1, 1909	Oct. 1, 1934	2 00	9 60	1 20
Willett E. Raynor	261	Jamaica Bay	2.0	Oct. 18, 1909	Oct. 18, 1934	2 00	4 00	50
William R. Rhinehart	635	Jamaica Bay	2.8	Nov. 4, 1909	Nov. 4, 1924	2 00	5 60	70
William R. Rhinehart	636	Jamaica Bay	3.2	Nov. 4, 1909	Nov. 4, 1924	2 00	6 40	80
Daniel Rowland	189	Jamaica Bay	2.5	Nov. 10, 1896	Nov. 10, 1911	25	63	63
Daniel Rowland	503	Jamaica Bay	3.6	July 11, 1899	July 11, 1924	25	90	90
Daniel Rowland	143	Jamaica Bay	4.0	June 16, 1908	June 16, 1933	2 00	8 00	1 00
Daniel Rowland	346	Jamaica Bay	3.4	June 16, 1908	June 16, 1933	2 00	6 80	85
Daniel Rowland	345B	Jamaica Bay	5.6	May 10, 1910	May 10, 1935	2 00	11 20	1 40
Benjamin Ryder	203	Jamaica Bay	1.6	Dec. 22, 1896	Dec. 22, 1911	25	40	40
Benjamin Ryder	246	Jamaica Bay	2.0	Oct. 12, 1897	Oct. 12, 1912	25	50	50
Benjamin Ryder	97	Jamaica Bay	1.8	Oct. 26, 1909	Oct. 26, 1934	2 00	3 60	45
Benjamin Ryder	3	Jamaica Bay	1.8	Oct. 26, 1909	Oct. 26, 1934	2 00	3 60	45
Benjamin Ryder	126	Jamaica Bay	.6	Oct. 26, 1909	Oct. 26, 1934	2 00	1 20	15
Grace L. Ryder	119	Jamaica Bay	.8	Oct. 28, 1909	Oct. 28, 1934	2 00	1 60	20
Joseph Ryder	288	Jamaica Bay	2.0	Feb. 8, 1898	Feb. 8, 1913	25	50	50
Joseph Ryder	283	Jamaica Bay	9.0	Mar. 8, 1898	Mar. 8, 1913	25	2 25	2 25
Joseph Ryder	432	Jamaica Bay	9.2	Mar. 22, 1910	Mar. 22, 1935	2 00	18 40	2 30
William M. Remsen	472	Jamaica Bay	29.6	May 9, 1910	May 9, 1935	2 00	59 20	7 40
Thomas Remsen	473	Jamaica Bay	8.0	June 2, 1910	June 2, 1935	2 00	16 00	2 00
George W. Robinson	912A	Raritan Bay	3.0	Oct. 13, 1911	Oct. 13, 1926	2 00	6 00	75
William Ruddock	239	Long Island Sound	6.0	Nov. 10, 1909	Nov. 10, 1924	25	1 50	1 50
Sealshipt Oyster System	913	Raritan Bay	42.6	May 11, 1897	May 11, 1912	25	10 65	10 65
Sealshipt Oyster System	924	Raritan Bay	58.2	Jan. 11, 1898	Jan. 11, 1913	25	14 55	14 55
Sealshipt Oyster System	99	Raritan Bay	43.6	April 11, 1899	April 11, 1914	25	10 90	10 90

Sealshipt Oyster System	966	Raritan Bay	36.4	Nov. 10, 1903	Nov. 10, 1918	25	9	10	9	10
Standard Oyster Company	903	Raritan Bay	6.3	Nov. 28, 1910	Nov. 28, 1935	2 00	12	60	1	58
Standard Oyster Company	902	Raritan Bay	5.0	Nov. 28, 1910	Nov. 28, 1935	2 00	10	00	1	25
Standard Oyster Company	904	Raritan Bay	4.2	Nov. 28, 1910	Nov. 28, 1935	2 00	8	40	1	05
Standard Oyster Company	905	Raritan Bay	4.3	Nov. 28, 1910	Nov. 28, 1935	2 00	8	60	1	08
George M. Still	946	Raritan Bay	5.4	Sept. 8, 1903	Sept. 8, 1918	25	1	35	1	35
George M. Still	947	Raritan Bay	1.4	Sept. 8, 1903	Sept. 8, 1918	25		35		35
George M. Still	849	Raritan Bay	6.8	Aug. 1, 1910	Aug. 10, 1935	2 00	13	60	1	70
George W. Sanbeg	911	Raritan Bay	4.4	Aug. 11, 1896	Aug. 11, 1911	25	1	10	1	10
George W. Sanbeg	948	Raritan Bay	12.8	Dec. 9, 1902	Dec. 9, 1917	25	3	20	3	20
Stinemire & Fisher	921	Raritan Bay	1.8	Aug. 11, 1896	Aug. 11, 1911	25		45		45
Sofield & Frazer	995	Raritan Bay	104.4	July 25, 1911	July 25, 1926	2 00	208	80	26	10
Sealshipt Oyster System	Several	Long Island Sound	255.6	Dec. 12, 1905	Dec. 12, 1920	25	63	90	63	90
Sealshipt Oyster System	Plot B	Long Island Sound	88.7	April 10, 1906	April 10, 1921	25	22	18	22	18
Sealshipt Oyster System	Several	Long Island Sound	65.0	July 13, 1909	July 13, 1924	2 00	280	00	16	25
Sealshipt Oyster System	Several	Long Island Sound	60.0	July 13, 1909	July 13, 1924	2 00	120	00	15	00
Sealshipt Oyster System	542	Jamaica Bay	2.8	July 20, 1908	July 20, 1933	2 00	1	60		70
Sealshipt Oyster System	68	Jamaica Bay	2.0	July 20, 1908	July 20, 1933	2 00	4	00		50
Sealshipt Oyster System	64	Jamaica Bay	1.0	July 20, 1908	July 20, 1933	2 00	2	00		25
Sealshipt Oyster System	209	Jamaica Bay	12.6	Aug. 14, 1908	Aug. 14, 1933	2 00	25	20	3	15
Sealshipt Oyster System	207	Jamaica Bay	14.2	June 21, 1911	June 21, 1936	2 00	28	40	3	55
Sealshipt Oyster System	327	Jamaica Bay	11.6	June 21, 1911	June 21, 1936	2 00	23	20	2	90
Charles S. Sofield	522	Jamaica Bay	25.6	Jan. 7, 1911	Jan. 7, 1936	2 00	51	20	6	40
Charles S. Sofield	536	Jamaica Bay	1.4	Jan. 7, 1911	Jan. 7, 1936	2 00	2	80		35
Charles S. Sofield	556	Jamaica Bay	15.2	Jan. 7, 1911	Jan. 7, 1936	2 00	30	40	3	80
Charles S. Sofield	526	Jamaica Bay	20.0	Jan. 7, 1911	Jan. 7, 1936	2 00	40	00	5	00
Charles S. Sofield	523	Jamaica Bay	1.4	Jan. 7, 1911	Jan. 7, 1936	2 00	2	80		35
Charles S. Sofield	110	Jamaica Bay	5.2	Aug. 13, 1910	Aug. 13, 1935	2 00	10	40	1	30
Charles S. Sofield	171	Jamaica Bay	2.4	Sept. 10, 1910	Sept. 10, 1935	2 00	4	80		60
Charles S. Sofield	469	Jamaica Bay	12.0	Jan. 7, 1911	Jan. 7, 1936	2 00	24	00	3	00
Sofield & Frazer	154	Jamaica Bay	1.6	Jan. 7, 1911	Jan. 7, 1936	2 00	3	20		40
Sofield & Frazer	256	Jamaica Bay	.8	Jan. 7, 1911	Jan. 7, 1936	2 00	1	60		20
Sofield & Frazer	169	Jamaica Bay	3.2	Oct. 9, 1910	Oct. 9, 1935	2 00	6	40		80
Sofield & Frazer	168	Jamaica Bay	3.2	Jan. 9, 1911	Jan. 9, 1936	2 00	6	40		80
Ella Sofield	90	Jamaica Bay	22.6	Jan. 9, 1911	Jan. 9, 1936	2 00	45	20	5	65
Julia Sofield	140	Jamaica Bay	27.0	Jan. 9, 1911	Jan. 9, 1936	2 00	54	00	6	75
Julia Sofield	170	Jamaica Bay	4.4	Jan. 9, 1911	Jan. 9, 1936	2 00	8	80	1	10
Henry L. Schmeelk	314	Jamaica Bay	2.8	Feb. 8, 1898	Feb. 8, 1913	25		70		70
Henry L. Schmeelk	318	Jamaica Bay	5.0	Dec. 14, 1897	Dec. 14, 1912	25	1	25	1	25
Erastus W. Seaman	178	Jamaica Bay	3.6	Aug. 11, 1896	Aug. 11, 1911	25		90		90
Erastus W. Seaman	278	Jamaica Bay	15.2	Nov. 9, 1897	Nov. 9, 1912	25	3	80	3	80
Herman M. Schmeelk	411	Jamaica Bay	29.8	July 18, 1898	July 18, 1913	25	7	45	7	45
Herman M. Schmeelk	412	Jamaica Bay	13.8	July 18, 1898	July 18, 1913	25	3	45	3	45
Herman M. Schmeelk	468	Jamaica Bay	5.4	Oct. 11, 1898	Oct. 11, 1913	25	1	35	1	35
Herman M. Schmeelk	509	Jamaica Bay	80.8	May 9, 1899	May 9, 1914	25	20	20	20	20
Herman M. Schmeelk	541	Jamaica Bay	26.8	Oct. 9, 1900	Oct. 8, 1913	25	6	70	6	70
Hannah M. Starkey	462	Jamaica Bay	2.2	July 18, 1898	July 8, 1913	25		55		55
William R. Schenck	501	Jamaica Bay	25.8	Oct. 10, 1899	Oct. 10, 1914	25	6	45	6	45

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
W. Eldred Sprague	373	Jamaica Bay	4.4	July 18, 1898	July 18, 1913	$0 25	$1 10	$1 10
W. Eldred Sprague	374	Jamaica Bay	14.6	July 18, 1898	July 18, 1913	25	3 65	3 65
W. Eldred Sprague	405	Jamaica Bay	9.2	Aug. 15, 1898	Aug. 15, 1913	25	2 30	2 30
W. Eldred Sprague	406	Jamaica Bay	7.2	Aug. 15, 1898	Aug. 15, 1913	25	1 80	1 80
W. Eldred Sprague	470	Jamaica Bay	33.2	Aug. 15, 1898	Aug. 15, 1913	25	8 30	8 30
Ezra & Theodore Sprague	454	Jamaica Bay	9.0	Oct. 11, 1898	Oct. 11, 1913	25	2 25	2 25
Ezra & Theodore Sprague	451	Jamaica Bay	5.2	Mar. 21, 1910	Mar. 21, 1935	2 00	10 40	1 30
Ezra & Theodore Sprague	450	Jamaica Bay	5.8	Mar. 21, 1910	Mar. 21, 1935	2 00	11 60	1 45
Ezra & Theodore Sprague	366	Jamaica Bay	1.2	Mar. 21, 1910	Mar. 21, 1935	2 00	2 40	30
Theodore Sprague	429	Jamaica Bay	7.2	Mar. 21, 1910	Mar. 21, 1935	2 00	14 40	1 80
Theodore Sprague	396	Jamaica Bay	1.4	Mar. 21, 1910	Mar. 21, 1935	2 00	2 80	35
Ezra Sprague	375	Jamaica Bay	1.2	Mar. 21, 1910	Mar. 21, 1935	2 00	2 40	30
Ezra Sprague	433A	Jamaica Bay	1.6	Mar. 22, 1910	Mar. 22, 1935	2 00	3 20	40
Ezra Sprague	433B	Jamaica Bay	1.6	Mar. 22, 1910	Mar. 22, 1935	2 00	3 20	40
Ezra Sprague	434	Jamaica Bay	2.4	Mar. 22, 1910	Mar. 22, 1935	2 00	4 80	60
Webb Sprague	425	Jamaica Bay	3.0	Mar. 22, 1910	Mar. 22, 1935	2 00	6 00	75
Webb Sprague	422	Jamaica Bay	2.8	Mar. 22, 1910	Mar. 22, 1935	2 00	5 60	70
Webb Sprague	423	Jamaica Bay	3.0	Mar. 22, 1910	Mar. 22, 1935	2 00	6 00	75
John H. Schmeelk, No. 1	305	Jamaica Bay	4.4	April 12, 1898	April 12, 1913	25	1 10	1 10
John H. Schmeelk	45	Jamaica Bay	3.6	June 13, 1910	June 13, 1935	2 00	7 20	90
John H. Schmeelk	49	Jamaica Bay	7.0	June 13, 1910	June 13, 1935	2 00	14 00	1 75
Richard H. Smith	371	Jamaica Bay	6.2	July 18, 1898	July 18, 1913	25	1 55	1 55
Richard H. Smith	400	Jamaica Bay	10.0	July 18, 1898	July 18, 1913	25	2 50	2 50
John H. Schmeelk, No. 2	201	Jamaica Bay	2.8	Nov. 10, 1896	Nov. 10, 1911	25	70	70
John H. Schmeelk	211	Jamaica Bay	4.4	April 13, 1897	April 13, 1912	25	1 10	1 10
John H. Schmeelk	312	Jamaica Bay	9.8	Mar. 8, 1898	Mar. 8, 1913	25	2 45	2 45
John H. Schmeelk	11	Jamaica Bay	3.6	Aug. 23, 1909	Aug. 23, 1934	2 00	7 20	90
John H. Schmeelk	21	Jamaica Bay	3.8	Aug. 23, 1909	Aug. 23, 1934	2 00	7 60	95
John H. Schmeelk	632	Jamaica Bay	0.8	Oct. 20, 1909	Oct. 20, 1924	2 00	1 60	20
John H. Schmeelk, No. 3	212	Jamaica Bay	12.6	Feb. 9, 1897	Feb. 9, 1912	25	3 15	3 15
John H. Schmeelk, No. 3	313	Jamaica Bay	9.0	Mar. 8, 1898	Mar. 8, 1913	25	2 25	2 25
John H. Schmeelk, No. 3	13	Jamaica Bay	3.0	June 16, 1908	June 16, 1933	2 00	6 00	75
John H. Schmeelk, No. 3	14	Jamacia Bay	4.0	June 16, 1908	June 16, 1933	2 00	8 00	1 00
John H. Schmeelk, No. 3	18	Jamaica Bay	4.2	June 16, 1908	June 16, 1933	2 00	8 40	1 05
Wm. H. Sellars	596	Jamaica Bay	7.2	May 13, 1902	May 13, 1917	25	1 80	1 80
M. H. Sickman	599	Jamaica Bay	7.2	Jan. 14, 1902	Jan. 14, 1917	25	1 80	1 80
George T. Soper	413	Jamaica Bay	7.2	April 4, 1910	April 4, 1935	2 00	14 40	1 80
George T. Soper	614	Jamaica Bay	12.4	April 4, 1910	April 4, 1935	2 00	24 80	3 10
George T. Soper	420	Jamaica Bay	6.4	April 4, 1910	April 4, 1935	2 00	12 80	1 60

George T. Soper	611	Jamaica Bay	4.8	April 4, 1910	April 4, 1935	2 00	9 60	1 20
George T. Soper	437	Jamaica Bay	5.8	April 4, 1910	April 4, 1935	2 00	11 60	1 45
Wm. T. Schmeelk	98	Jamaica Bay	9.2	May 3, 1910	May 3, 1935	2 00	18 40	2 30
George A. Schmeelk	210	Jamaica Bay	10.8	Mar. 14, 1910	Mar. 14, 1935	2 00	21 60	2 70
George A. Schmeelk	281	Jamaica Bay	2.2	Mar. 14, 1910	Mar. 14, 1935	2 00	4 40	55
George A. Schmeelk	103	Jamaica Bay	2.2	Mar. 24, 1910	Mar. 24, 1935	2 00	4 40	55
Wm. F. Schmeelk	30	Jamaica Bay	2.4	May 10, 1911	May 10, 1936	2 00	4 80	60
H. W. Schmeelk Oyster Company	317	Jamaica Bay	13.2	Feb. 8, 1898	Feb. 8, 1913	25	3 30	3 30
H. W. Schmeelk Oyster Company	573	Jamaica Bay	11.0	Sept. 10, 1901	Sept. 10, 1916	25	2 75	2 75
H. W. Schmeelk Oyster Company	577	Jamaica Bay	3.8	Nov. 12, 1901	Nov. 12, 1916	25	95	95
H. W. Schmeelk Oyster Company	580	Jamaica Bay	11.4	Nov. 12, 1901	Nov. 12, 1916	25	2 85	2 85
H. W. Schmeelk Oyster Company	581	Jamaica Bay	5.6	Nov. 12, 1901	Nov. 12, 1916	25	1 40	1 40
H. W. Schmeelk Oyster Company	209	Jamaica Bay	.4	Aug. 14, 1908	Aug. 14, 1933	2 00	80	10
H. W. Schmeelk Oyster Company	208	Jamaica Bay	6.0	Jan. 4, 1909	Jan. 4, 1934	2 00	12 00	1 50
H. W. Schmeelk Oyster Company	624	Jamaica Bay	2.0	May 10, 1909	May 10, 1924	2 00	4 00	50
H. W. Schmeelk Oyster Company	142	Jamaica Bay	5.0	Mar. 11, 1910	Mar. 11, 1935	2 00	10 00	1 25
H. W. Schmeelk Oyster Company	328	Jamaica Bay	5.4	Mar. 10, 1910	Mar. 10, 1935	2 00	10 80	1 35
H. W. Schmeelk Oyster Company	130	Jamaica Bay	2.4	Mar. 10, 1910	Mar. 10, 1935	2 00	4 80	60
H. W. Schmeelk Oyster Company	193	Jamaica Bay	3.2	Mar. 10, 1910	Mar. 10, 1935	2 00	6 40	80
H. W. Schmeelk Oyster Company	172	Jamaica Bay	27.2	Mar. 10, 1910	Mar. 10, 1935	2 00	54 40	6 80
H. W. Schmeelk Oyster Company	176	Jamaica Bay	3.8	Mar. 10, 1910	Mar. 10, 1935	2 00	7 60	95
H. W. Schmeelk Oyster Company	174	Jamaica Bay	5.0	Mar. 10, 1910	Mar. 10, 1935	2 00	10 00	1 25
H. W. Schmeelk Oyster Company	273	Jamaica Bay	8.8	Mar. 10, 1910	Mar. 10, 1935	2 00	17 60	2 20
H. W. Schmeelk Oyster Company	225	Jamaica Bay	5.2	Mar. 10, 1910	Mar. 10, 1935	2 00	10 40	1 30
H. W. Schmeelk Oyster Company	232	Jamaica Bay	4.0	Mar. 10, 1910	Mar. 10, 1935	2 00	8 00	1 00
H. W. Schmeelk Oyster Company	276	Jamaica Bay	3.0	Mar. 10, 1910	Mar. 10, 1935	2 00	6 00	75
H. W. Schmeelk Oyster Company	485	Jamaica Bay	23.2	Mar. 10, 1910	Mar. 10, 1935	2 00	46 40	5 80
H. W. Schmeelk Oyster Company	36	Jamaica Bay	5.4	Mar. 10, 1910	Mar. 10, 1935	2 00	10 80	1 35
H. W. Schmeelk Oyster Company	37	Jamaica Bay	3.0	Mar. 10, 1910	Mar. 10, 1935	2 00	6 00	75
H. W. Schmeelk Oyster Company	39	Jamaica Bay	4.8	Mar. 10, 1910	Mar. 10, 1935	2 00	9 60	1 20
H. W. Schmeelk Oyster Company	99	Jamaica Bay	1.6	Mar. 14, 1910	Mar. 14, 1935	2 00	3 20	40
H. W. Schmeelk Oyster Company	62	Jamaica Bay	5.2	Mar. 14, 1910	Mar. 14, 1935	2 00	10 40	1 30
H. W. Schmeelk Oyster Company	35	Jamaica Bay	8.0	Mar. 14, 1910	Mar. 14, 1935	2 00	16 00	2 00
H. W. Schmeelk Oyster Company	337	Jamaica Bay	6.6	Mar. 14, 1910	Mar. 14, 1935	2 00	13 20	1 65
H. W. Schmeelk Oyster Company	76	Jamaica Bay	1.8	Mar. 14, 1910	Mar. 14, 1935	2 00	3 60	45
H. W. Schmeelk Oyster Company	147	Jamaica Bay	12.6	Mar. 14, 1910	Mar. 14, 1935	2 00	25 20	3 15
H. W. Schmeelk Oyster Company	192	Jamaica Bay	1.2	Mar. 14, 1910	Mar. 14, 1935	2 00	2 40	30
H. W. Schmeelk Oyster Company	107	Jamaica Bay	4.8	Mar. 14, 1910	Mar. 14, 1935	2 00	9 60	1 20
H. W. Schmeelk Oyster Company	351	Jamaica Bay	8.0	Mar. 14, 1910	Mar. 14, 1935	2 00	16 00	2 00
H. W. Schmeelk Oyster Company	191	Jamaica Bay	1.6	Mar. 14, 1910	Mar. 14, 1935	2 00	3 20	40
H. W. Schmeelk Oyster Company	532	Jamaica Bay	14.0	Mar. 14, 1910	Mar. 14, 1935	2 00	28 00	3 50
H. W. Schmeelk Oyster Company	106	Jamaica Bay	1.4	Mar. 14, 1910	Mar. 14, 1935	2 00	2 80	35
H. W. Schmeelk Oyster Company	38	Jamaica Bay	3.4	Mar. 14, 1910	Mar. 14, 1935	2 00	6 80	85
H. W. Schmeelk Oyster Company	109	Jamaica Bay	6.6	Mar. 14, 1910	Mar. 14, 1935	2 00	13 20	1 65
H. W. Schmeelk Oyster Company	486	Jamaica Bay	2.8	Mar. 14, 1910	Mar. 14, 1935	2 00	5 60	70
H. W. Schmeelk Oyster Company	78	Jamaica Bay	4.4	Mar. 14, 1910	Mar. 14, 1935	2 00	8 80	1 10
H. W. Schmeelk Oyster Company	141	Jamaica Bay	6.0	Mar. 14, 1910	Mar. 14, 1935	2 00	12 00	1 50
H. W. Schmeelk Oyster Company	148	Jamaica Bay	3.2	Mar. 14, 1910	Mar. 14, 1935	2 00	6 40	80

FRANCHISES — (*Continued*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
H. W. Schmeelk Oyster Company	493	Jamaica Bay	2.8	Mar. 14, 1910	Mar. 14, 1935	$2 00	$5 60	$0 70
H. W. Schmeelk Oyster Company	533	Jamaica Bay	13.2	Mar. 14, 1910	Mar. 14, 1935	2 00	26 40	3 30
H. W. Schmeelk Oyster Company	145	Jamaica Bay	5.2	Mar. 14, 1910	Mar. 14, 1935	2 00	10 40	1 30
H. W. Schmeelk Oyster Company	489	Jamaica Bay	12.6	Mar. 14, 1910	Mar. 14, 1935	2 00	25 20	3 15
H. W. Schmeelk Oyster Company	58	Jamaica Bay	2.4	Mar. 14, 1910	Mar. 14, 1935	2 00	4 80	60
H. W. Schmeelk Oyster Company	220	Jamaica Bay	4.2	Mar. 14, 1910	Mar. 14, 1935	2 00	8 40	1 05
H. W. Schmeelk Oyster Company	226	Jamaica Bay	1.8	Mar. 14, 1910	Mar. 14, 1935	2 00	3 60	45
H. W. Schmeelk Oyster Company	335	Jamaica Bay	6.6	Mar. 14, 1910	Mar. 14, 1935	2 00	13 20	1 65
H. W. Schmeelk Oyster Company	623	Jamaica Bay	5.0	May 10, 1909	May 10, 1924	2 00	10 00	1 25
H. W. Schmeelk Oyster Company	59	Jamaica Bay	6.0	Dec. 14, 1908	Dec. 14, 1933	2 00	12 00	1 50
H. W. Schmeelk Oyster Company	75	Jamaica Bay	4.0	June 13, 1910	June 13, 1935	2 00	8 00	1 00
H. W. Schmeelk Oyster Company	74	Jamaica Bay	3.2	June 13, 1910	June 13, 1935	2 00	6 40	80
H. W. Schmeelk Oyster Company	230	Jamaica Bay	5.8	June 13, 1910	June 13, 1935	2 00	11 60	1 45
William M. Schmeelk	15	Jamaica Bay	3.2	Jan. 4, 1909	Jan. 4, 1934	2 00	6 40	80
William M. Schmeelk	316	Jamaica Bay	8.8	Jan. 4, 1909	Jan. 4, 1934	2 00	17 60	2 20
Valentine Smith	365	Jamaica Bay	2.0	Mar. 22, 1910	Mar. 22, 1935	2 00	4 00	50
Valentine Smith	362	Jamaica Bay	3.6	Mar. 22, 1910	Mar. 22, 1935	2 00	7 20	90
Geo. S. Smith	397	Jamaica Bay	.8	Mar. 22, 1910	Mar. 22, 1935	2 00	1 60	20
J. Frank Smith	441	Jamaica Bay	1.0	Mar. 22, 1910	Mar. 22, 1935	2 00	2 00	25
Samuel E. Smith	440	Jamaica Bay	2.6	Mar. 22, 1910	Mar. 22, 1935	2 00	5 20	65
J. F. & S. E. Smith	385	Jamaica Bay	3.0	Mar. 22, 1910	Mar. 22, 1935	2 00	6 00	75
Sprague & Doughty	444	Jamaica Bay	1.7	Mar. 21, 1910	Mar. 21, 1935	2 00	3 40	43
Sprague & Doughty	381	Jamaica Bay	3.4	Mar. 21, 1910	Mar. 21, 1935	2 00	6 80	85
Sprague & Doughty	447	Jamaica Bay	3.2	Mar. 21, 1910	Mar. 21, 1935	2 00	6 40	80
Sprague & Doughty	382	Jamaica Bay	2.4	Mar. 21, 1910	Mar. 21, 1935	2 00	4 80	60
Sprague & Doughty	387	Jamaica Bay	13.8	Mar. 21, 1910	Mar. 21, 1935	2 00	27 60	3 45
Sprague & Doughty	418	Jamaica Bay	3.0	Mar. 21, 1910	Mar. 21, 1935	2 00	6 00	75
Sprague & Doughty	442	Jamaica Bay	5.2	Mar. 21, 1910	Mar. 21, 1935	2 00	10 40	1 30
Sprague & Doughty	279	Jamaica Bay	1.8	Mar. 21, 1910	Mar. 21, 1935	2 00	3 60	45
Sprague & Doughty	380	Jamaica Bay	.8	Mar. 21, 1910	Mar. 21, 1935	2 00	1 60	20
Smith Sprague	390	Jamaica Bay	4.0	Mar. 21, 1910	Mar. 21, 1935	2 00	8 00	1 00
Smith Sprague	570	Jamaica Bay	5.0	Mar. 21, 1910	Mar. 21, 1935	2 00	10 00	1 25
Smith Sprague	417	Jamaica Bay	1.6	Mar. 21, 1910	Mar. 21, 1935	2 00	3 20	40
Smith Sprague	416	Jamaica Bay	2.2	Mar. 21, 1910	Mar. 21, 1935	2 00	4 40	55
Smith Sprague	393	Jamaica Bay	1.6	Mar. 21, 1910	Mar, 21, 1935	2 00	3 20	40
Smith Sprague	438	Jamaica Bay	3.0	Mar. 21, 1910	Mar. 21, 1935	2 00	6 00	75
Smith Sprague	388	Jamaica Bay	3.6	Mar. 21, 1910	Mar. 21, 1935	2 00	7 20	90
Smith Sprague	394	Jamaica Bay	1.8	Mar. 21, 1910	Mar. 21, 1935	2 00	3 60	45
Henry Schlatenburg	238	Jamaica Bay	4.0	Nov. 10, 1909	Nov. 10, 1924	2 00	8 00	00

John R. Skidmore	81	Jamaica Bay	2.6	Aug. 11, 1896	Aug. 11, 1911	25	65		65
Henry Schumacker	249	Jamaica Bay	7.0	Oct. 12, 1897	Oct. 12, 1912	25	1 75	1	75
Henry Stubbs	Sec. A-93	Long Island Sound	25.0	April 23, 1900	April 23, 1950	25	6 25	6	25
Henry Stubbs	94	Long Island Sound	8.0	April 23, 1900	April 23, 1950	25	2 00	2	00
Stubbs & Allen	Sec. F-93	Long Island Sound	16.8	April 23, 1900	April 23, 1950	25	4 20	4	20
Josiah Thompson	91	Long Island Sound	18.2	April 10, 1900	April 10, 1950	25	4 55	4	55
Josiah Thompson	122	Long Island Sound	4.4	April 12, 1904	April 12, 1919	25	1 10	1	10
Josiah Thompson	123	Long Island Sound	1.4	June 14, 1904	June 14, 1919	25	35		35
Josiah Thompson	323	Long Island Sound	5.2	Dec. 14, 1910	Dec. 14, 1925	2 00	10 40	1	30
Samuel Thorne	105	Long Island Sound	29.0	June 11, 1901	June 11, 1916	25	7 25	7	25
E. S., J. H., Jr. & A. K. Tilley	23	Long Island Sound	47.3	Oct. 11, 1904	Oct. 11, 1914	25	11 83	11	83
John H. Tilley	326	Long Island Sound	30.4	Nov. 20, 1911	Nov. 20, 1926	2 00	60 80	7	60
Charles H. Vroom	Several	Long Island Sound	20.6	Nov. 10, 1910	Nov. 10, 1925	2 00	41 20	5	15
George H. Valentine	981	Raritan Bay	11.4	Sept. 21, 1910	Sept. 21, 1925	2 00	22 80	2	85
John R. Vail	436	Jamaica Bay	12.0	Sept. 13, 1898	Sept. 13, 1913	25	3 00	3	00
Peter William Van Ahnen	319	Jamaica Bay	9.6	Sept. 14, 1897	Sept. 14, 1912	25	2 40	2	40
Peter William Van Ahnen	500	Jamaica Bay	2.4	Oct. 10, 1899	Oct. 10, 1914	25	60		60
Peter William Van Ahnen	204	Jamaica Bay	1.0	Sept. 21, 1908	Sept. 21, 1933	2 00	2 00		25
Peter William Van Ahnen	32	Jamaica Bay	10.6	Sept. 21, 1908	Sept. 21, 1933	2 00	21 20	2	65
Peter William Van Ahnen	205	Jamaica Bay	8.2	Sept. 21, 1908	Sept. 21, 1933	2 00	16 40	2	05
J. H. & J. H., Jr. Vreeland	521	Jamaica Bay	5.0	April 11, 1900	April 11, 1915	25	25	1	25
J. H. & J. H., Jr. Vreeland	607	Jamaica Bay	10.0	June 10, 1902	June 10, 1917	25	2 50	2	50
J. H. & J. H., Jr. Vreeland	185	Jamaica Bay	12.0	June 22, 1908	June 22, 1933	2 00	24 00	3	00
J. H. Vreeland, Jr	633	Jamaica Bay	5.8	Oct. 20, 1909	Oct. 20, 1924	2 00	11 50	1	45
Estate, Herman Van Ahnen	41	Jamaica Bay	6.4	Sept. 11, 1908	Sept. 11, 1933	2 00	12 80	1	60
Estate, Herman Van Ahnen	304	Jamaica Bay	11.4	April 5, 1911	April 5, 1936	2 00	22 80	2	85
Estate, Herman Van Ahnen	519	Jamaica Bay	2.6	April 5, 1911	April 5, 1936	2 00	5 20		65
Estate, Herman Van Ahnen	54	Jamaica Bay	3.0	April 5, 1911	April 5, 1936	2 00	6 00		75
Estate, Herman Van Ahnen	73	Jamaica Bay	4.0	April 5, 1911	April 5, 1936	2 00	8 00	1	00
Anna Van Ahnen	40	Jamaica Bay	4.8	Sept. 11, 1908	Sept. 11, 1933	2 00	9 60	1	20
Richard Van Houghten	525	Jamaica Bay	14.8	Sept. 11, 1900	Sept. 11, 1915	25	3 70	3	70
Henry Von Twistern	555	Jamaica Bay	1.2	June 11, 1901	June 11, 1916	25	30		30
Henry Von Twistern	12	Jamaica Bay	2.4	Oct. 18, 1909	Oct. 18, 1934	2 00	4 80		60
C. P. Vreeland	608	Jamaica Bay	4.2	Oct. 20, 1909	Oct. 20, 1924	2 00	8 40	1	05
C. P. Vreeland	160	Jamaica Bay	2.4	Aug. 11, 1896	Aug. 11, 1911	25	60		60
Victor White	162	Jamaica Bay	4.4	Oct. 13, 1896	Oct. 14, 1911	25	1 10	1	10
John Wight	237	Jamaica Bay	3.8	Dec. 22, 1896	Dec. 22, 1911	25	95		95
William R. Wilson	518	Jamaica Bay	12.8	July 11, 1899	July 11, 1949	25	3 20	3	20
William R. Wilson	520	Jamaica Bay	36.0	April 11, 1900	April 11, 1915	25	9 00	9	00
Henry Warren	544	Jamaica Bay	9.4	Nov. 13, 1900	Nov. 13, 1915	25	2 35	2	35
Charles Weber	105	Long Island Sound	29.0	June 11, 1901	June 11, 1916	25	7 25	7	25
Charles Weber	14	Hempstead Harbor	1.6	June 14, 1910	June 14, 1925	2 00	3 20		40
Charles Weber	10	Hempstead Harbor	.6	June 14, 1910	June 14, 1925	2 00	1 20		
Weber & Degenhart	317	Hempstead Harbor	22.0	July 12, 1910	July 12, 1925	2 00	44 00	5	15
Dennis F. Ward	290	East Chester Bay	7.4	June 12, 1906	June 12, 1921	25	1 85	1	50
Dennis F. Ward	292	East Chester Bay	9.0	June 12, 1906	June 12, 1921	25	2 25	2	85
H. L. C. Wenk	567	Jamaica Bay	9.6	June 11, 1901	June 11, 1916	25	2 40	2	25
H. L. C. Wenk	568	Jamaica Bay	10.6	April 9, 1902	April 9, 1917	25	2 50	2	40
									50

FRANCHISES — (*Concluded*)

NAME	Lot No.	Location	Acres	Lease granted	Lease expires	Rate of rental	Annual rental	Annual tax
H. L. C. Wenk	569	Jamaica Bay	3.2	Aug. 13, 1901	Aug. 13, 1916	$0 25	$0 80	$0 80
Edward Weber	183	Jamaica Bay	3.2	Aug. 31, 1908	Aug. 31, 1933	2 00	6 40	80
Edward Weber	44	Jamaica Bay	2.0	Aug. 31, 1908	Aug. 31, 1933	2 00	4 00	50
Edward Weber	10	Jamaica Bay	4.4	Aug. 31, 1908	Aug. 31, 1933	2 00	2 80	1 10
Edward Weber	47	Jamaica Bay	5.8	Aug. 31, 1908	Aug. 31, 1933	2 00	11 60	1 45
Edward Weber	100	Jamaica Bay	2.0	May 25, 1909	May 25, 1934	2 00	4 00	50
Wofield & Mersereau	582	Jamaica Bay	3.6	May 25, 1909	May 25, 1934	2 00	7 20	90
Wofield & Mersereau	101	Jamaica Bay	2.8	May 25, 1909	May 25, 1934	2 00	5 60	70
Wofield & Mersereau	195	Jamaica Bay	2.0	May 18, 1909	May 18, 1934	2 00	4 00	50
Wofield & Mersereau	285	Jamaica Bay	2.8	May 25, 1909	May 25, 1934	2 00	5 60	70
Wofield & Mersereau	102	Jamaica Bay	1.4	May 25, 1909	May 25, 1934	2 00	2 80	35
Wofield & Mersereau	266	Jamaica Bay	6.4	Nov. 27, 1909	Nov. 27, 1934	2 00	12 80	1 60
William A. Winant	231	Jamaica Bay	4.4	Mar. 9, 1910	Mar. 9, 1935	2 00	8 80	1 10
John Whittaker	460	Jamaica Bay	5.2	April 8, 1910	April 8, 1935	2 00	10 40	1 30
John E. Watts	456	Jamaica Bay	6.8	April 8, 1910	April 8, 1935	2 00	13 60	1 70
Elizabeth Watts	427	Jamaica Bay	2.2	Jan. 27, 1911	Jan. 27, 1936	2 00	4 40	55
William H. Watts	445	Jamaica Bay	2.8	Jan. 27, 1911	Jan. 27, 1936	2 00	5 60	70
Total	.....	.....	15,480.2	.....	.....	.....	$18,296 41	$3,870 28

ANNUAL REPORT

OF THE

FISH CULTURIST.

ANNUAL REPORT

OF THE

FISH CULTURIST.

Hon. Thomas H. Guy, *Deputy Commissioner, Division of Fish and Game:*

Sir.— Herewith is presented my report upon the fish cultural work of the Conservation Commission during the fiscal year ended September 30, 1912.

This report includes statements from the foremen of the nine hatcheries with additional remarks based upon inspection trips made by me in regard to the condition of the stations, their needed improvements, the habits and diseases of the fishes and other aquatic species propagated by the State.

The output of the stations was 730,434,933 fish, an increase over the yield of 1911 of 28,986,539. The money value of the fish distributed in 1912 was $210,934.79, which shows a very large return for the investment for maintenance, repairs and improvements, purchase of eggs and miscellaneous expenses.

The number of species of aquatic animals, chiefly fish, propagated by the Commission in 1912 was 39, which includes a great variety of valuable food and game fishes besides lobsters and blue crabs.

In estimating the value of the fish produced it is necessary to add the brood stock at the stations which is increasing from year to year. At this time the brood fish are worth fully $10,000, if not more.

The marine auxiliary hatchery at Montauk, Long Island, demonstrated its usefulness in the development of eggs of the lobster, sea bass and scup. The auxiliary building at Cold Spring Harbor will also provide retaining tanks for live cod, and thus enable the Commission to renew its important work with that valuable food fish.

The experiments with short-nosed sturgeon and calico bass in ponds at Linlithgo were continued. While it is probable that the sturgeon will not lend itself readily to pond culture, there is no doubt that the fish will spawn naturally, and the only remaining

difficulty to be overcome is the loss of the fry through the accidental introduction of their enemies. It was found, at Linlithgo, that the calico bass will thrive best in a pond which is more or less muddy; some young fish were collected in the sturgeon pond from parent stock which was believed to be sexually immature, and this is the first successful experience with that species.

Investigations were made in the town of Warrensburg and in St. Lawrence county for two new hatchery sites provided for by appropriations of the last Legislature.

The enormous value of the fishery resources of New York has heretofore been mentioned. The State contains in its waters nearly 400 kinds of fish besides shellfish and crustaceans whose importance for food can hardly be overestimated. The vast coast line and the great inland seas give the State an advantage which is shared by few other commonwealths. In fish culture we have taken the front rank, and in order to maintain this enviable position, it is highly desirable to increase the facilities for work at our stations by making larger grants for the purchase and collection of eggs, adding several boats to the small number now in commission; by establishing several auxiliary stations and a biological laboratory on Long Island. In this laboratory and at the auxiliary stations the artificial culture of oysters, clams, scallops, lobsters, crabs and other economic species can be intelligently studied. Such work would greatly benefit the people, and would be quickly appreciated by all persons interested in the development of our marine resources.

VALUE OF HATCHERY OUTPUT 1912.

Station	Value of output	
Adirondack	$7,550 69	
Bath	9,096 65	
Caledonia	20,154 98	
Chautauqua	5,349 75	
Cold Spring Harbor	78,496 31	
Delaware	5,917 25	
Fulton Chain	5,077 50	
Linlithgo	11,509 91	
Oneida	67,781 75	
Total		$210,934 79

HATCHERY EXPENDITURES.

Maintenance fund	$47,353 51	
Collection of eggs	757 42	
Miscellaneous	674 47	
Official salaries	3,000 00	
Graded employees	9,720 00	
Total		$61,505 40

BROOD FISH AT STATIONS.

The Adirondack station has 75 brook trout. At Bath there were 1,000 brook trout. Caledonia reports 1,000 brook trout, 6,000 brown trout and 5,000 rainbow trout.

Cold Spring Harbor has 2,000 brook trout, 3,000 rainbow trout and 300 brown trout. Delaware has the following: 1,200 brook trout 18 months old, 1,508 brook trout 2 years old and 280 brook trout 3 years old. Linlithgo has 134 adult black bass and 200 calico bass adults.

FISH DISTRIBUTED BY STATE HATCHERIES.

Short-nosed sturgeon.
Bullhead or catfish.
Buckeye shiner.
Quinnat salmon.
Silver salmon.
Land locked salmon.
Brook trout.
Brown trout.
Black spotted trout.
Steelhead trout.
Rainbow trout.
Lake trout.
Shad.
River herring.
Whitefish.
Frostfish.
Lake herring.
Tullibee.
Smelt.
Maskalonge.
Pike.
Pikeperch.
Blue pike.
Yellow perch.
White perch.
Black bass, small mouthed.
Black bass, large mouthed.
Calico bass.
Sunfish.
Long eared sunfish.
Rock bass.
Silver bass.
Sea bass.
Scup.
Cod.
Tomcod.
Flatfish.
Lobster.
Blue crab.

FISH DISTRIBUTION IN 1912 BY STATIONS.

Adirondack.

Brook trout fry	910,000	
Brook trout fingerlings	417,044	
Brook trout adults	15	
		1,327,059
Lake trout fry	73,500	
Lake trout fingerlings	112,500	
		186,000
Brown trout fingerlings		5,000
Rainbow trout fingerlings		10,000
Whitefish fry		2,898,000
Frostfish fry		184,000
		4,610,059

Bath.

Brook trout fry	252,000	
Brook trout fingerlings	661,500	
		913,500
Lake trout fingerlings		106,000
Brown trout fry	75,000	
Brown trout fingerlings	104,500	
Brown trout yearlings	2	
		179,502
Rainbow trout fry	10,000	
Rainbow trout fingerlings	65,540	
Rainbow trout yearlings	3	
		75,543
		1,274,545

Caledonia.

Brook trout fry	354,000	
Brook trout fingerlings	498,500	
		852,500
Brown trout fry*	351,000	
Brown trout fingerlings	188,573	

*Eyed eggs brown trout shipped to other stations for development and distribution, 350 000.

Brown trout yearlings	25	
Brown trout adults	47	
		539,645
Lake trout fry	15,000	
Lake trout fingerlings	26,500	
		41,500
Rainbow trout fry*	246,000	
Rainbow trout fingerlings	378,050	
Rainbow trout adults	55	
		624,105
Lake herring fry		20,000,000
Pikeperch fry†		8,075,000
		30,132,750

Chautauqua.

Brook trout fry‡	127,500	
Brook trout fingerlings‡	117,600	
		245,100
Maskalonge fry¶		9,500,000
Lake herring fry		4,275,000
		14,020,100

Cold Spring Harbor.

Brook trout fry	345,000	
Brook trout fingerlings	114,000	
		459,000
Rainbow trout fry	55,000	
Rainbow trout fingerlings	43,500	
		98,500
Steelhead trout fingerlings		400
Whitefish fry		250,000
Smelt fry		142,000,000

* Eyed eggs rainbow trout shipped to other stations for development and distribution 201,000.

† From eggs sent from Oneida station.

‡ Brook trout fingerlings sent to Caledonia and Bath stations not included in this report, 199,500.

¶ Maskalonge eggs furnished the Pennsylvania Commission, 300,000. Maskalonge fry furnished the Pennsylvania Commission, 200,000, not included in this report.

Pike perch fry	500,000
Yellow perch fry	950,000
Sea Bass fry	10,298,590
Tomcod fry	126,000,000
Flatfish fry	86,000,000
Scup fry	750,512
Lobster fry	34,245,420
Blue crab adults	2,000
	401,554,422

Delaware.

Brook trout fry	309,000	
Brook trout fingerlings	371,500	
Brook trout adults	17	
		680,517
Brown trout fry	150,000	
Brown trout fingerlings	86,000	
		236,000
Rainbow trout fry	45,000	
Rainbow trout fingerlings	33,000	
		78,000
		994,517

Fulton Chain.

Brook trout fry	150,000	
Brook trout fingerlings	265,500	
Brook trout adults	10	
		415,510
Lake trout fingerlings		29,000
Land locked salmon fingerlings		22,500
Whitefish fry		7,000,000
		7,467,010

Linlithgo.

Catfish (or bullhead) fry		1,000
Short nosed sturgeon adults		34
Shad fry*	6,303,695	
Shad fingerlings	300,000	
		6,603,695
River herring fry		38,500,000
Brook trout fry	115,000	
Brook trout fingerlings	158,000	
		273,000
Yellow perch fry		4,050,000
Black bass fingerlings		5,150
Long eared sunfish fingerlings		3,500
		49,436,379

Oneida.

Bullheads adult		4
Tullibee fry	8,774,000	
Tullibee adults	1	
		8,774,001
Pike adult	4	
Pike perch eggs†	48,600,000	
Pike perch fry	136,600,000	
Pike perch adults	10	
		185,200,014
Yellow perch eggs‡	.....	
Yellow perch fry	26,000,000	
Yellow perch fingerlings	569,500	
Yellow perch adults	6	
		26,569,506
Small mouthed bass fry	288,300	
Small mouthed bass fingerlings	113,300	
Small mouthed bass adults	10	
		401,610

* Of these 1,800,000 were presented to the State by the Pennsylvania Fish Commissioner.

† 10,950,000 eggs sent to Caledonia; fry distributed from there.

‡ 3,500,000 sent to Linlithgo and fry planted from there.

Calico bass adults	6
Rock bass adults	6
Silver bass adults	4
	220,945,151

FISH DISTRIBUTION, 1911–1912.

	1911	1912
Adirondack	7,416,877	4,610,059
Bath	1,020,461	1,274,545
Caledonia	49,140,150	30,132,750
Chautauqua	23,221,725	14,020,100
Cold Spring Harbor	347,650,400	401,554,422
Delaware	821,500	994,517
Fulton Chain	5,201,050	7,467,010
Linlithgo	25,657,983	49,436,379
Oneida	236,318,248	220,945,151
	701,448,394	730,434,933

FISH DISTRIBUTION BY SPECIES.

Summary for the Year Ending September 30, 1912.

Short-nosed Sturgeon adults	34
Catfish (Bullhead) fry	1,000
Catfish (Bullhead) adults	4
Shad fry	6,303,695
Shad fingerlings	300,000
River Herring fry	38,500,000
Frostfish fry	184,000
Whitefish fry	10,148,000
Lake Herring fry	24,275,000
Tullibee fry	8,774,000
Tullibee adult	1
Land Locked Salmon fingerlings	22,500
Steelhead Trout fingerlings	400
Brown Trout fry	576,000

Brown Trout fingerlings	384,073
Brown Trout yearlings	27
Brown Trout adults	47
Rainbow Trout fry	356,000
Rainbow Trout fingerlings	530,090
Rainbow Trout yearlings	3
Rainbow Trout adults	55
Lake Trout fry	88,500
Lake Trout fingerlings	274,000
Brook Trout fry	2,562,500
Brook Trout fingerlings	2,603,644
Brook Trout adults	42
Smelt fry	142,000,000
Pike adults	4
Maskalonge fry	9,500,000
Calico Bass adults	6
Rock Bass adults	6
Silver Bass adults	4
Long eared sunfish fingerlings	3,500
Small mouthed black bass fry	288,300
Small mouthed black bass fingerlings	118,450
Small mouthed black bass adults	10
Pikeperch eggs	48,600,000
Pikeperch fry	145,175,000
Pikeperch adults	10
Yellow perch fry	31,000,000
Yellow perch fingerlings	569,500
Yellow perch adults	6
Sea bass fry	10,298,590
Tom cod fry	126,000,000
Flatfish fry	86,000,000
Scup fry	750,512
Lobster fry	34,245,420
Blue crab adults	2,000
	730,434,933

VALUE OF FISH DISTRIBUTED BY STATE HATCHERIES, 1912.

Adirondack.

910,000	brook trout fry	$1,820 00
417,044	brook trout fingerlings	4,170 44
15	brook trout adults	3 75
73,500	lake trout fry	73 50
112,500	lake trout fingerlings	562 50
5,000	brown trout fingerlings	50 00
10,000	rainbow trout fingerlings	100 00
2,898,000	whitefish fry	724 50
184,000	frostfish fry	46 00
		$7,550 69

Bath.

252,000	brook trout fry	$504 00
661,500	brook trout fingerlings	6,615 00
106,000	lake trout fingerlings	106 00
75,000	brown trout fry	150 00
104,500	brown trout fingerlings	1,045 00
2	brown trout yearlings	50
10,000	rainbow trout fry	20 00
65,540	rainbow trout fingerlings	655 40
3	rainbow trout yearlings	75
		$9,096 65

Caledonia.

354,000	brook trout fry	$708 00
498,500	brook trout fingerlings	4,985 00
351,000	brown trout fry	702 00
188,573	brown trout fingerlings	1,885 73
25	brown trout yearlings	6 25
47	brown trout adults	11 75
15,000	lake trout fry	15 00

26,500	lake trout fingerlings	$132 50
246,000	rainbow trout fry	492 00
378,050	rainbow trout fingerlings	3,780 50
55	rainbow trout adults	13 75
20,000,000	lake herring fry	5,000 00
8,075,000	pikeperch fry	2,422 50
		$20,154 98

Chautauqua.

127,500	brook trout fry	$255 00
117,600	brook trout fingerlings	1,176 00
9,500,000	maskalonge fry	2,850 00
4,275,000	lake herring fry	1,068 75
		$5,349 75

Cold Spring Harbor.

345,000	brook trout fry	$690 00
114,000	brook trout fingerlings	1,140 00
55,000	rainbow trout fry	110 00
43,500	rainbow trout fingerlings	435 00
400	steelhead trout fingerlings	4 00
250,000	whitefish fry	62 50
142,000,000	smelt fry	28,400 00
500,000	pikeperch fry	150 00
950,000	yellow perch fry	285 00
10,298,590	sea bass fry	2,574 65
126,000,000	tomcod fry	25,200 00
86,000,000	flatfish fry	10,750 00
750,512	scup fry	93 81
34,245,420	lobster fry	8,561 35
2,000	blue crab adults	40 00
		$78,496 31

Delaware.

309,000	brook trout fry	$618 00
371,500	brook trout fingerlings	3,715 00
17	brook trout adults	4 25
150,000	brown trout fry	300 00
86,000	brown trout fingerlings	860 00
45,000	rainbow trout fry	90 00
33,000	rainbow trout fingerlings	330 00
		$5,917 25

Fulton Chain.

150,000	brook trout fry	$300 00
265,500	brook trout fingerlings	2,655 00
10	brook trout adults	2 50
29,000	lake trout fingerlings	145 00
22,500	land-locked salmon fingerlings	225 00
7,000,000	whitefish fry	1,750 00
		$5,077 50

Linlithgo.

1,000	catfish fry	$0 30
34	short nosed sturgeon adult	57 50
6,303,695	shad fry	1,891 11
300,000	shad fingerlings	1,500 00
38,500,000	river herring fry	4,812 50
115,000	brook trout fry	230 00
158,000	brook trout fingerlings	1,580 00
4,050,000	yellow perch fry	1,215 00
5,150	black bass fingerlings	206 00
3,500	long earned sunfish fingerlings	17 50
		$11,509 91

Oneida.

4	catfish adults	$1 00
8,774,000	tullibee fry	2,193 50
1	tullibee adult	25
4	pike adults	2 00
48,600,000	pikeperch eggs	3,645 00
136,600,000	pikeperch fry	40,980 00
10	pikeperch adults	5 00
26,000,000	yellow perch fry	7,800 00
569,500	yellow perch fingerlings	2,847 50
6	yellow perch adults	1 00
288,300	small mouthed black bass fry	5,766 00
113,300	small mouthed black bass fingerlings	4,532 00
10	small mouthed black bass adults	5 00
6	calico bass adults	1 50
6	rock bass adults	1 00
4	silver bass adults	1 00
		$67,781 75

UNITED STATES BUREAU OF FISHERIES.

DISTRIBUTION IN THE STATE OF NEW YORK, FISCAL YEAR 1912.

Location.	Waters.	Eggs.	Fry.	Fingerlings.
	CATFISH.			
Clayton	St. Lawrence River			900
Erieville	Erieville Reservoir			300
	WHITEFISH			
Battery Park	New York Aquarium	1,000,000		
Fullers Bay	Lake Ontario		1,000,000	
Grenadiers Is	Lake Ontario		2,500,000	
South Bay	Oneida Lake		350,000	
Stony Pt	Lake Ontario		600,000	
Tibbitts Pt	Lake Ontario		3,000,000	
Wilson Bay	Lake Ontario		3,000,000	
	LAKE HERRING			
Fullers Bay	Lake Ontario		95,000	
	SILVER SALMON			
Battery Park	New York Aquarium	2,000		
	CHINOOK SALMON.			
Battery Park	New York Aquarium	2,000		
Tuxedo Park	Tuxedo Park Lake	10,000		
	RAINBOW TROUT.			
Altamont	Bozenkill Creek			3,000
Apulia	Butternut Creek			225
Babylon	Blanchard Pond			300
Battery Park	New York Aquarium	5,000		
Bay Shore	Brightwater Lakes			400
Benson Mines	Star Lake		9,000	
Callicoon	North Branch			600
Cambridge	Owl Kill Creek			1,500
Georgetown	Middletown Creek			2,000
Freeville	Fall Creek, Tributary			4,000
Katonah	Stoney Hollow Lake			3,200
Lake Placid	Copperas Pond			750
Madawaska	Quebec Brook			1,500
Oneonta	Otego Creek & Tributaries			8,000
	Ouleout River			5,000
	Third Brook			1,000
Patterson	Croton River			4,000

RAINBOW TROUT — (*Concluded*):

Location.	Waters.	Eggs.	Fry.	Fingerlings.
Pearl River	Gardiner Lake	.....	.....	1,600
Rome	Big Alder Creek.....	.....	.....	3,000
	Point Rock Brook.....	.....	.....	3,000
Sabattis	Flat Fish Pond.....	25,000	.....	.....
Swartwood	Jackson Creek	.....	.....	2,000
Syracuse	Butternut Creek	.....	.....	600
	Limestone Creek	.....	.....	600
	Onondaga Creek	.....	.....	600
	LANDLOCKED SALMON			
Au Sable Forks..	Taylor Pond	.....	.....	1,000
Battery Park	New York Aquarium.....	1,000	.....	.....
Caledonia	Brandreth Lake	10,000	.....	.....
Lake Delaware ..	Lake Delaware	20,000	.....	.....
Lake George	Lake George	25,000	.....	.....
Lake Mahopac ...	Lake Mahopac	.....	.....	1,000
Long Lake West..	Doctors Pond	15,000	.....	.....
	South Pond	.....	2,535	.....
Northville	Piseco Lake	.....	2,535	.....
	BLACKSPOTTED TROUT			
Saranac Inn	State Fish Commission..	40,000	.....	.....
	LAKE TROUT.			
Caledonia	State Fish Commission..	50,000	.....	.....
Charity Shoals ..	Lake Ontario	.....	420,000	.....
Forestport	Lake Honnedaga	.....	.....	900
Fox Island	Lake Ontario	.....	405,000	.....
Fuller Bay	Lake Ontario	.....	193,700	.....
Grenadier Island.	Lake Ontario	.....	550,000	.....
Hammondsport ..	Lake Keuka.....	.....	75,000	.....
Hayes Point	Lake Ontario	.....	125,000	.....
Long Lake West..	Catlin Lake	.....	.....	1,150
	Loon Pond	50,000	.....	.....
Little Grenad'r Is.	Lake Ontario	.....	140,000	.....
Northville	Lake Piseco	.....	50,000	.....
	Sacandaga Lake	.....	50,000	.....
Stony Point	Lake Ontario	.....	125,000	.....
Willsboro	Warm Pond	.....	25,000	.....
Wilson Bay	Lake Ontario	.....	122,000	.....
	BROOK TROUT			
Adams	Raystone Creek	.....	25,000	.....
	Sandy Creek, N. Branch..	.....	40,000	.....
Apulia	French Brook	.....	.....	100
	Maskhaw Brook	.....	.....	100
	Ranger Brook	.....	.....	50
	Wills Brook	.....	.....	200
Battery Park	New York Aquarium....	5,000	.....	.....

BROOK TROUT — (*Continued*):

Location.	Waters.	Eggs.	Fry.	Fingerlings.
Beaver River	Beaver River	.....	.....	250
Benson Mines	Ellis Brook	.....	10,000	.....
	Little River	.....	15,000	.....
	Tamarack Creek	.....	15,000	.....
Berlin	Little Hoosick River.....	.....	.....	2,000
Big Indian	Esopus Creek	.....	.....	1,500
Buffalo	State Cancer Laboratory.	.....	.....	35
Cambridge	Coulton Brook	.....	10,000	.....
	Cottrell's Brook..... ...	.....	5,000	.....
Canaan	Funnell Canaan Ctr. Pd..	.....	.....	700
Canton	Little River	.....	30,000	.....
Carmel	Croton River, W. Branch.	.....	15,000	.....
Catskill	Kiskatom Creek	.....	.....	300
Cornwall	Awessema Creek	.....	4,000	600
	Mineral Spring Brook...	.....	4,000	900
Cortland	Messenger Creek	.....	15,000	.....
Delhi	Elk Creek	.....	5,000	.....
	Peake's Brook	.....	5,000	.....
	Steel's Brook	.....	5,000	.....
Forestport	Little Woodhull Brook..	.....	.....	300
Georgetown	Gladding Brook	.....	5,000	.....
	Mann Brook	.....	10,000	.....
	Mariposa Creek	.....	10,000	.....
	Plank Creek	.....	5,000	.....
	Thompson Brook	.....	5,000	.....
Gouverneur	Huckleberry Lake	.....	25,000	.....
	Keene Creek	.....	15,000	.....
	Mud Lake	.....	25,000	.....
	Sunshine Lake	.....	15,000	.....
Greene	Carter Brook	.....	5,000	.....
	Crandall Brook.....	.....	10,000	.....
	Indian Brook	.....	10,000	.....
	Peck Brook	.....	10,000	.....
	Wheeler Brook	.....	10,000	.....
	Winston Brook	.....	10,000	.....
Harriman	Lake Frederick	.....	.....	1,500
Harrisville	Big Hill Pond.....	.....	25,000	.....
Hartsdale	Rum Brook	.....	.....	700
Homer.....	Crouse's Pond	.....	20,000	.....
Lake Mahopac ...	Lake Mahopac	.....	.....	2,075
Lake Placid	Winch Pond	.....	.....	250
Larchmont	Pine Creek	.....	.....	600
Lincolndale	Lake Lincolndale	.....	.....	2,400
Madawaska	Quebec Brook	.....	.....	1,500
Massena	Bennetts Pond	.....	.....	50
Mills	Hartford Creek	.....	.....	500
Millbrook	Omruavarra Brook	.....	.....	300

BROOK TROUT — (*Continued*):

Location.	Waters.	Eggs.	Fry.	Fingerlings.
New City	Crum Creek Pond.....	.....	.....	1,000
Newton Falls ...	Moosehead Lake	.....	25,000	.....
New Lebanon	Burnemead Brook	.....	.....	500
	Dean Brook	.....	.....	1,000
	Hull Brook	.....	.....	1,000
	Meander Brook	.....	.....	500
	West Meadow Brook.....	.....	.....	1,000
	Wyomonock Creek	.....	.....	2,000
North Creek	North Creek	.....	.....	2,000
	Wakeley Brook	.....	.....	1,500
Northville	Charley Lake	.....	20,000	.....
	Coonis Lake	.....	15,000	.....
	Howland Run	.....	5,000	.....
	Priest Vlaie Run.....	.....	5,000	.....
	Rhudes Vlaie Run.....	.....	5,000	.....
Nyack	Larchdell Ponds	.....	4,000	.....
Oneonta	Baker Brook	.....	4,000	.....
	Ford Brook	.....	5,000	.....
	Hotaling Hollow Creek..	.....	6,000	.....
	Huyck Brook	.....	4,000	.....
	Mill Creek	.....	8,000	.....
	Norton Brook	.....	3,000	.....
	Otego Creek & Tributaries.....		15,000	.....
Patterson	Croton River	.....	.....	400
	Quaker Brook	.....	.....	300
Port Henry	Buck Pond	.....	10,000	.....
	Club House Pond.....	.....	15,000	.....
	Lower Moss Pond.....	.....	10,000	.....
	Schroon River.....	.....	10,000	.....
	Secret Pond	.....	10,000	.....
	Upper Moss Pond.....	.....	10,000	.....
Port Jervis	Bushkill Brook	.....	.....	1,000
	Cahoonzie Park Lake.....	.....	.....	1,000
	Shinglekill Brook.....	.....	.....	1,000
	Steenekill Brook.....	.....	.....	1,000
Potsdam	Cutting Brook	.....	6,000	.....
	Peck Brook	.....	6,000	.....
	Rutman Brook	.....	6,000	.....
	Sanford Brook	.....	6,000	.....
	Trout Brook	.....	16,000	.....
Richfield	Bridgewater Creek	.....	15,000	.....
Rockville	Trout Lake	.....	.....	200
Rome	Dirreen Brook	.....	.....	1,000
	Fish Creek	.....	30,000	.....
	Pringle Brook	.....	.....	1,000
St. Regis Falls...	East Brook	.....	20,000	.....
Salisbury Center..	Fly Creek	.....	10,000	.....

BROOK TROUT — (*Concluded*):

Location.	Waters.	Eggs.	Fry.	Fingerlings.
Schenectady	Alplans Creek		15,000	
	Lishaskill Creek		10,000	
South Berlin	Kronk Brook		10,000	
Springville	Foote's Pond			1,000
Stephentown	Black River			2,500
	Browns Brook			1,000
	Chapel Creek			1,500
	Douglas Brook			1,000
	Kinderhook Brook			2,000
	Roaring Brook			1,000
Syracuse	Carpenter Brook		6,000	
	De Montfredy Brook		6,000	
	Geddes Brook			100
	Mount Fredel Run		10,000	
	Pecks Brook			100
	Pools Brook			250
Thurman	Viele Pond			2,500
Troy	Poesten Kill River, Trib.		8,000	
Watertown	Brownville Creek		10,000	
	Felts Mills Creek		15,000	
	Frenchs Creek		5,000	
	Johnson's Creek		10,000	
	Kings Creek		10,000	
	Mosher's Pond		10,000	
	Stebbins Creek		10,000	
	Twin Ponds		10,000	
	West Creek		20,000	
	White's Creek		10,000	
Williamstown	Salmon River		20,000	
Winthrop	Davis Brook		10,000	
	SMALL-MOUTHED BLACK BASS.			
Addison	Canisteo River			300
	Tuscarora River			1,500
Binghamton	Sky Lake			450
Esopus	Kells Lake			300
Hammondsport	Lake Henko			3,000
Schenectady	Mariaville Pond			450
Wayland	Loon Lake			2,850
	ROCK BASS.			
Poughkeepsie	Lyons Lake			325
Walden	Walkill River			400
	CRAPPIE			
Gloversville	Mountain Lake			75
	Van Dewbergs Pond			75
	Woodwards Lake			75
Olean	Allegany River			150

BLACK BASS

Location.	Waters.	Eggs.	Fry.	Fingerlings.
Addison	Canisteo River			450
Altmar	Black Pond			120
	Henderson's Pond			120
	Long Pond			120
	Sheridan Pond			120
Auburn	Owasco Lake			240
Binghamton	Chenango River			150
	Susquehanna River			225
Clayton	St. Lawrence River			720
Clifton Springs	Canandaigua Creek			120
Eaton	Eaton Reservoir			120
Gloversville	Caroga Lake			180
	Mountain Lake			180
Greene	Chenango River			225
	Echo Lake			225
Homer	Skaneateles Lake			120
Ithaca	Cayuga Lake			300
Johnstown	Canada Lake			120
	Green Lake			120
	Lilly Lake			120
	Otter Lake			120
	Stewart Lake			180
	Stuik Lake			120
	West Lake			120
Lisle	Otselic River			120
Lockport	18-Mile Creek, East Branch			120
	Gravel Creek			80
	Red Creek			120
Norwich	Chenango Lake			225
Paul Smiths	Osgood Lake			180
Salisbury Center	Eaton Pond			120
Saranac Inn Sta.	Upper Saranac Lake			120
Williamstown	Panther Lake			180

PIKE PERCH

Addison	Canisteo River		1,000,000	
Cambridge	Lake Lauderdale		500,000	
	Schoolhouse Pond		500,000	
Carleton Island	St. Lawrence River		3,000,000	
Grass Bay	St. Lawrence River		3,000,000	
Highland Falls	Cranberry Lake		500,000	
	Popolopen Lake		500,000	
Monticello	Kiamesha Lake		1,000,000	
Mud Creek	Lake Ontario		2,000,000	
New York	New York Aquarium	1,000,000		
Ravena	Ravena Reservoir		500,000	
Troy	Hudson River		1,000,000	
Walden	Wallkill River		600,000	
Wayland	Loon Lake		1,500,000	

YELLOW PERCH

Location.	Waters.	Eggs.	Fry.	Fingerlings.
Battery Park	New York Aquarium.....	1,000,000	.....	.....
Camden	Fish Creek	.....	.....	80
Cape Vincent	St. Lawrence River.....	.....	50,000	.....
Fallsburgh	Ruddicks Pond	.....	.....	120
Lockport	Red Creek	.....	.....	375
Schenectady	Mohawk River	.....	.....	70
	Veeder's Pond	.....	.....	30
Walden	Wallkill River	.....	600,000	.....

WHITE PERCH

Walden	Walkill River	.....	600,000	.....
Westchester Co...	Browns Pond	.....	500,000	.....

THE HATCHERIES.

ADIRONDACK STATION.

The output for 1912 was not as large as usual owing to the failure of the very young fry to take food. Trout fry will usually begin to feed as soon as the food sac is absorbed, upon beef liver properly ground and prepared; but this year they did not take the liver freely and considerable loss was sustained on this account. We collected freshwater mussels from Clamshell pond, a small lake situated at a considerable distance in the dense forest, the pond taking its name from the large number of these shells that lie embedded in the sand upon its shores. The mussels were ground very fine and fed to the trout fry which took them greedily, and later accepted the liver which is their regular food.

While collecting brook trout eggs from Bone pond, on the hatchery preserve, during the fall of 1911, the trout were confined in boxes which were anchored in the lake near the nets. We had in these boxes nearly 800 brook trout that were not quite ready to spawn. On the night of October 25th, about 300 of these fish were stolen and destroyed, the fish having been scooped up in a basket which was found lying on the shore of the lake. The loss included not only the fish stolen but also the eggs not yet taken besides the spawn which could be taken in future years. By prompt action and co-operation with the Game Protector the miscreants were caught and heavily fined. Since this occurrence we have had regular night watchmen to guard the nets and boxes.

Brown Trout caught in Potash Creek, Greene County, 1912. Weight, 8 lbs.

In May, 1912, a gasoline engine and pump were installed to pump water from a large spring underground to the hatchery building. We hope this water will be of great value during the winter and spring,— providing a supply of pure cold water free from the aquatic life so abundant in lake water and found so injurious to the young fry.— *Reported by Milo F. Otis, Foreman, Upper Saranac, N. Y.*

BATH STATION.

The hatching of brook trout, brown trout, rainbow trout and lake trout eggs was more successful than in any former year, and the number of fry and fingerlings distributed was greater than ever before. The fish were freer from disease than for many years, owing to the introduction of artesian and spring water uncontaminated by sewage.

The results of lake trout collecting in Keuka lake were disappointing. Plenty of fish were taken; but most of them were males. We did not see the usual number of yellow perch on the lake trout spawning beds.—*Reported by Henry Davidson, Foreman, Bath, N. Y.*

This station has suffered more than any other except Caledonia from the effects of polluted water. Every serious disease except goitre in brook trout has been overcome by eliminating the original hatchery brook from the system of pond and hatchery circulation. It only remains now to protect the great springs which furnish the principal supply for the ponds and races. This can be done by the purchase of five acres of ground surrounding the springs. The property is now overrun by cattle, pigs and sheep, and the pollution caused thereby is, in my judgment, a source of trout disease. The station is growing in importance every year. The yield in 1912 was more than 254,000 trout in excess of 1911, and this can be still further increased by safeguarding the water supply.

CALEDONIA STATION.

The number of lake trout eggs obtained for this hatchery was very small owing to the change in the law of some of the States through which the shipment of eggs outside of the State limits is forbidden. An arrangement has been made with a number of fishing firms on Lake Erie by the Commission which we hope

will result in the collection of a very large number of lake trout and whitefish eggs in future.

The collection of lake herring eggs at Erie, Pa., with the cooperation of the Pennsylvania Commission, and at Dunkirk, N. Y., through the help of the Desmond Fish Company and others was very successful. A very large percentage of the eggs were hatched, and the fry were planted in Lake Erie.

The brown trout fry and fingerlings have been in better condition during the past year than for several years, and we are holding over 6,000 or 7,000 fingerlings for stock fish. If the water continues to be as good as it is now, the supply of stock fish will be much increased. The station also has 5,000 rainbow trout fingerlings which will be raised for breeders.

The rainbow trout began to spawn on January 2d, about two months earlier than ever before, and the eggs taken were the best ever obtained here. A few brook trout are being reared for brood stock.— *Reported by Frank Redband, Foreman, Mumford, N. Y.*

The most pressing need of this station at present is a thorough cleaning of the headwaters of Spring creek. It is equally important to use cement to replace all decayed timbers and planks now about the ponds. The removal of the ice house to the opposite side of the creek from where it now stands would be a decided improvement. It will cost from $8,000 to $10,000 to put the property in good condition for work.

CHAUTAUQUA STATION.

The season at this hatchery was very favorable for brook trout work. The number of fry and fingerlings was so large that many of them were sent to other hatcheries for distribution.

The collection of lake herring eggs at Erie, Pa., and Dunkirk, N. Y., was smaller than in the preceding year. The eggs were not so good and did not hatch as well as before.

The maskalonge work broke all former records.

A new gas engine and rotary pump for pumping lake water into the hatchery were installed in December, 1911. The water circulation was changed so that as the water leaves the hatchery it can now be elevated to the newly installed cement ponds above

ground. Four cement ponds or races for rearing trout have been built. The water flows from one set to the other and thence into a newly constructed earth pond, and in this way the capacity for rearing trout fingerlings has been doubled. A new outside trough has been erected, to give artesian water a longer run before entering the hatchery, thus overcoming the excess air which has heretofore been so troublesome. A new cement walk has been built from the hatchery to the road. The grounds have been regraded and seeded. High water last spring flooded the hatchery grounds and the old trout ponds. The trout in the ponds were saved by putting up sideboards. The new ponds are above this flood mark.— *Reported by G. E. Winchester, Foreman, Bemus Point, N. Y.*

Cold Spring Harbor Station.

A fine lot of brook trout eggs was collected from the ponds of the Southside Sportsmen's Club, of Long Island, and these were distributed among several of the State hatcheries. Nearly enough brook trout and rainbow trout eggs were obtained from the hatchery ponds to fill all the applications.

The tomcod work was carried on as usual. Eggs were collected in Peconic Bay, Long Island, from fish caught for the markets. The small auxiliary hatchery on the shore of Cold Spring Harbor added greatly to our output and gave room in the main hatchery for other work. The tomcod fry were planted in salt water bays of Long Island.

A very large number of smelt eggs were obtained, and the percentage of fertilized eggs was greater than usual. Some yellow perch eggs were hatched; but the jars were filled with smelt eggs and the space for perch was limited.

The lobster hatching at Montauk was more than ever successful owing to the completion of the auxiliary hatchery on Fort Pond Bay. There was no loss of eggs such as occurred in former years in the old floating boxes. The number of fry was not so large as in 1911 because the Connecticut fishermen did not bring their lobsters to the Montauk market. A great many lobster eggs were obtained from them last year.

The number of eggs of scup and sea bass was much increased. This work can be greatly enlarged by the use of a motor boat

which would permit us to visit several fisheries daily and collect eggs. The saltwater work could be carried on to much better advantage by building small auxiliary hatcheries near the grounds from which the eggs are collected. The hatchery at Montauk is well located for the work done at that point, and thanks are due to Captain E. B. Tuthill for many courtesies, and for valuable help given by him and his fishing crew.

By making some important changes in the main hatching room we would be enabled to hatch a great many more fish.

A large number of fresh water ponds on Long Island suitable for fish other than trout and open to public fishing should be stocked with good fish. This branch of fish culture, like the salt water work, should receive more attention.— *Reported by Charles H. Walters, Foreman, Cold Spring Harbor, N. Y*

DELAWARE STATION.

The distribution of trout for the year was the largest for any year since the hatchery was established. Rainbow trout were propagated for the first time, and very successfully.— *Reported by H. E. Annin, Foreman, Margaretville, N. Y.*

This station raised brook trout, brown trout and rainbow trout; chiefly brook trout. The yield of trout in 1912 exceeded that of 1911 by 173,017. The water supply for the hatchery and ponds is derived entirely from Whortleberry creek. There are no springs near the station which could be utilized during the summer months. This is unfortunate, as a generous supply of spring water would enable the Commission to increase the output very greatly, and the region stocked from Margaretville hatchery needs a far greater number of trout than can be supplied with the present plant.

FULTON CHAIN STATION.

This station has distributed brook trout, lake trout, land locked salmon and whitefish during the year, and there has been an increase in the yield of most of these fish. No frostfish eggs were taken because the whitefish began to spawn at the same time as the frostfish and the nets set for whitefish could not be taken out before the lakes were covered with ice. Whitefish are increasing annually. The first eggs were taken on November 7, and the last

on November 16. The total catch was 1685, of which 786 were females and 899 males besides several thousand small whitefish which were too young to spawn. The quantity of whitefish eggs taken was 263 quarts or 11,046,000 eggs, of which 1,680,000 were shipped to the Oneida hatchery. The number of lake trout eggs from fish caught in the whitefish net was smaller than usual, and we did not take as many eggs from wild brook trout owing to the work of putting in a new water main. This work could not be done earlier because of the high water. Land-locked salmon eggs were presented to the Commission by the United States Bureau of Fisheries and the fingerlings resulting therefrom were planted in Lake George. Several thousand visitors come to the hatchery every year. The station needs a supply of spring water so as to keep trout fingerlings safely during the summer months. — *Reported by William H. Burke, Foreman, Old Forge, N. Y.*

During most summers the lake water which supplies this station becomes so warm in early June as to endanger the trout fingerlings kept in the hatchery. It would be greatly advantageous to buy certain springs in the vicinity which were utilized at one time for keeping hatchery trout. As the trout at the Adirondack hatchery develop very late we should have spring water at Fulton Chain. This hatchery distributes a great many whitefish and frostfish to applicants for lakes of the Fulton Chain and elsewhere, and it furnishes also about 500,000 brook trout and a smaller number of lake trout each year.

LINLITHGO STATION.

The large reservoir was cracked by frost the same as last year. It has again been plugged with concrete; but the frost will open it more and more every year until it goes to pieces. The fence bounding the Bonneville estate has been built, and all of the State's portion of the line fences is now protected by American field fence 45 inches high. A new concrete sidewalk 40 feet long and 4 feet wide has been laid from the front of the residence to the road, and the engine and pump at the well east of the hatchery have been covered by a suitable building. All the brook trout eggs needed for the hatchery were collected in Alder lake, Ulster county, through the generosity of Mr. S. D. Coykendall,

the owner of the lake, and the surplus was sent to the Delaware hatchery. Mr. E. C. Brown, of Copake, presented to the hatchery 60 quarts of yellow perch eggs. The Pennsylvania Fish Commission gave us nearly 2,000,000 shad fry from its Torresdale hatchery in exchange for pike perch eggs collected at the Oneida hatchery.

The shad rearing operations resulted in the planting of 300,000 fingerlings from fry placed in the pond May 21, fed on water meal and liberated in the Kleinekill August 28th. The number of calico bass fingerlings reared in 1912 is larger than in all previous years combined. They had not been liberated at the time of closing this report. The method of rearing this fish has been partially solved here for the first time.

One of the difficulties at this station is to supply food enough for the brood bass during the summer. Unless the river fish are more abundant during the coming year, it will be necessary to buy food for the bass. Only one brood bass has died this year.

Two new ponds have been built. With the present water supply only one more can be established. If a concrete dam were built across the Roeliff Jansen Kill at or near the site of the old dam which was standing in part when the property was acquired by the State, an unlimited supply of water would be furnished, many additional ponds could be built and the work of the station greatly increased.— *Reported by Wallace D. Rhines, Foreman, Linlithgo, N. Y.*

Experiments have been made in the propagation of the short-nosed sturgeon at Linlithgo for the past two years. The fish spawned in 1911 and 1912; but the fry were not discovered in 1911 when the pond was drained, and it is uncertain whether any will be seen as the result of the spawning in 1912. It seems that black bass and other predaceous fish get into the pond in some mysterious way and destroy all the young sturgeon. About 100 sturgeon were placed in a pond during the shad fishing season, and no difficulty was experienced in keeping them alive and in excellent condition. Perhaps the experiment will be repeated and further efforts made to protect the fry from their enemies in the future. The calico bass produced a considerable number of young in a pond containing sturgeon, and it appears that the spawning fish

Photo. R. E. Gooding.

ONEIDA HATCHERY INTERIOR. CONSTANTIA, 1912.

thrive better and mature their eggs with greater certainty in ponds rendered muddy by other fish like the sturgeon. The increase in distribution from the Linlithgo station was nearly 24,000,000 fish. The species propagated are common catfish, short-nosed sturgeon, shad, river herring, brook trout, yellow perch, black bass and long eared sunfish. The number of shad planted, reached a total of 6,603,695. The river herring were found to be excellent food for the young black bass.

ONEIDA STATION.

At the time when I took charge of this station, May 1, 1912, there were 912 quarts of pikeperch eggs in the hatchery. Every jar was filled with these eggs. From May 21 to May 30 the fry were hatched to the number of 136,600,000. This represents the full capacity for pikeperch at present. The season was very favorable for pikeperch operations as it was wet and cold.

The number of yellow perch fry distributed was less than in 1911; but there was a great increase in the output of black bass and yellow perch fingerlings. Of pikeperch fry there were planted in Oneida lake 116,625,000. These fry were deposited in many localities near the islands and in the bays along the shore.

Nets were set in the lake on May 6 for the collection of small mouthed black bass and up to May 30, 746 bass had been taken for the hatchery ponds. The number of bass fry planted in Oneida lake was 279,000, and later in the season 41,200 fingerlings were liberated in the lake.

A long continued drought of nearly seven weeks caused the supply pond (or hatchery pond) to become very low and necessitated the drawing off of the hatching ponds and the planting of the fingerling bass in the lake.

Fifty-one fish representing 23 species collected in Oneida lake, were sent to the State Fair at Syracuse, and after the close of the fair were planted in Onondaga lake and Janesville reservoir.

The eye disease of yellow perch and sunfish fingerlings in the creeks was inconsiderable in comparison with reports of former years. Lamprey eels are as numerous and as destructive as ever. During the summer and fall many thousands of black bass fingerlings were seen around the shores of the lake.

In netting black bass for the ponds in May a large number of silver bass were taken — as many as 700 to 800 in one day.— *Reported by Dan E. Miller, Foreman, Constantia, N. Y.*

When the dam at the hatchery pond has been put in good repair, it will be practicable to construct additional ponds for the cultivation of minnows for black bass food and of silver bass for stocking suitable waters. The silver bass is an excellent food fish, similar in its spawning habits to the striped bass and white perch. Although its artificial culture is little known, it is highly probable that the fish can be successfully propagated in ponds. It would form a valuable addition to many waters of the State.

NOTES ON SPECIES.

CARP.

The Commission has received numerous letters from persons who desire to raise carp and who apply for that fish. As the State no longer propagates the carp, and we have no information about private breeders who can furnish it, such correspondents are referred to the U. S. Bureau of Fisheries, Washington, D. C.

PEARL ROACH.

In 1897 the writer called attention to the pearl roach in the Bulletin of the American Museum of Natural History, N. Y., vol. IX, 334. Living examples had been under observation for some time previously in the New York Aquarium. These were obtained in one of the lakes of Central park. The pearl roach is the European rudd. It was introduced into Central park in some unrecorded way, possibly by inadvertence among gold fish transferred from the Queen's Gardens at Windsor. Whatever the origin of the introduction, the rudd is now well known, not only in Central park but also in Prospect park, Brooklyn, and perhaps in other city waters. It has been planted also in a pool belonging to Mr. Ferguson at Huntington Harbor, L. I. The New York Aquarium presented some gold fish to Mr. Huntington, and among them were some small silvery fish with red fins. Specimens of the young are now in the office of the Conservation Commission in Albany where they were at once recognized as the rudd or pearl roach. It is stated that the species has multiplied greatly in the

Photo. R. E. Gooding.

DAM ON FREDERICK CREEK, HATCHERY WATER SUPPLY, CONSTANTIA.

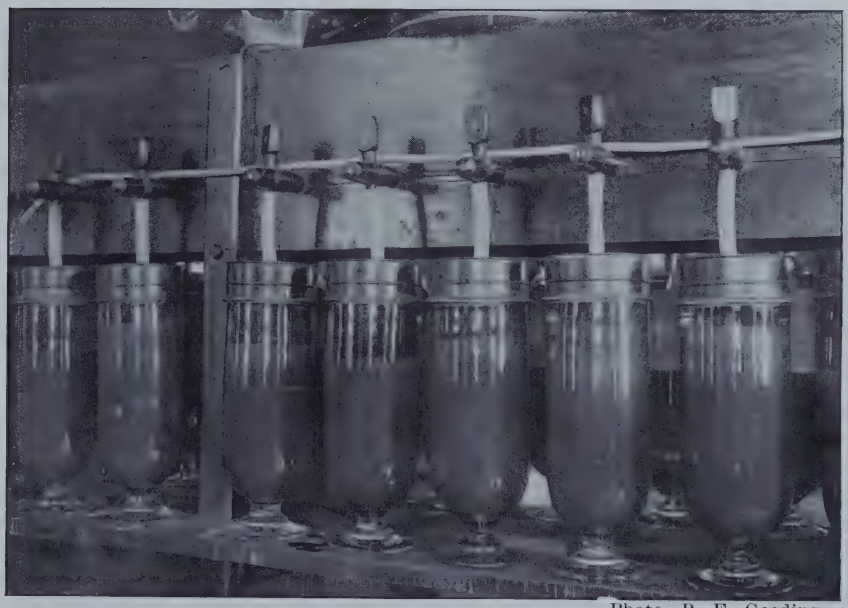

Photo. R. E. Gooding.

PIKE PERCH EGGS IN JARS. CONSTANTIA, 1912.

basin above referred to. The rudd is a beautiful fish for artificial basins and aquaria. Individuals measuring a foot in length with crimson fins fully developed are even more beautiful than the gold fish, golden idle and golden tench. A picture of the fish is found in Webster's Dictionary under the name of rudd.

THE EEL.

The reproduction of the common eel was for many years a mystery; but recent authors have elucidated the life history of this well known animal, and the following references to the literature will be found useful. They are taken chiefly from Dr. Tracey's "Annotated List of Fishes Known to Inhabit the Waters of Rhode Island," in the 40th Annual Report of the Commissioners of Inland Fisheries of Rhode Island, 1910, page 71.

1864: Gill, Proc. Acad. Nat. Sci., Phila.

1881: Goode, Bull. U. S. Fish. Com., I, 71.

1886: Delarge, Compte Rendu., C.III, 690.

1897: McIntosh and Masterman, British Marine Food Fishes, 434.

1908: Gill, Science, N. S., XXVIII, 845.

1908: Tracey, Rep. R. I. Fish Com., 43.

1909: Ehrenbaum, Nordisches Plankton, 10, 380.

1910: Tracey, Rep. R. I. Fish Com., 70.

In his studies of male eels from Great South Bay, L. I., Dr. John A. Ryder observed that the male is smaller than the female of the same age; that it has very large eyes, a remarkably short snout and other distinguishing characters. The section of gravid eels would show the difference of the sexes very clearly. The chief reason why the eggs have usually been overlooked by fishermen is that the ovaries in which the small and delicate eggs lie contain a mass of fatty cells deeply embedding them so that the whole ovary, unless carefully examined under the microscope, appears to consist only of fat. The male organs may be distinguished readily by their color and their lobular form.

One of the most interesting facts in the life history of the American eel is the death of the adults soon after the close of the spawning period. The swarms of eels migrating up our rivers

during the early spring consist entirely of fry or elvers. Dr. Tracey publishes the following notes in the report last quoted:

"Spawning takes place in the ocean in winter. The place of spawning is probably in water 500 fathoms or more deep, along the steep slope where the continental plateau shelves off into the great oceanic depths. The young when hatched are in a larval condition and known as *Leptocephali,* which require nearly a year for the metamorphosis into young eels. In the meantime they gradually approach the coast and enter the rivers in April and May, *i. e.,* in the spring a year after hatching. The young eels two or three inches long, which can be seen moving up the rivers in the spring are thus a year and two or three months old. The mature eels which migrate down the rivers in the autumn to spawn are probably 8 to 10 years old. (Gemzöe.) They die after spawning.

Young taken when ice breaks up in the spring, 1 to 1½ inches long. Prof. Jenks found specimens 2¼ inches long April 19.

SHAD.

Up to May 13, 1912, the Hudson river fishermen had taken 87.5 quarts or 2,450,000, shad eggs for the Linlithgo station. Mr. Rhines stated that the fishermen had trouble to get enough male fish for good fertilization. That was the first week of egg collecting, and conditions became more favorable when the temperature rose to the proper degree. On May 24, when the water temperature was 70 degrees, the eggs in the hatching jars were developing much better than they did at first. The number of eggs in the station at that time was 6,608,000.

In rearing shad in the ponds at Linlithgo great care is needed to protect them from little eels which will enter the ponds through water supply pipes unless they are kept out by screens and by seining.

RIVER HERRING.

Up to May 24, 1912, the Linlithgo station had obtained 25,000,000 herring eggs from the Hudson river. The eggs were hatching very nicely. Last year the quality of the eggs was very poor.

Photo. R. E. Gooding.

Black Bass Ponds. Constantia, 1912.

SEA HERRING.

Many herring are taken in the bays of Long Island by torching. This seems to be a very destructive method and should be carefully regulated if not entirely prevented.

CHINOOK SALMON.

This species has been introduced into Lake Champlain by the United States Bureau of Fisheries. Whether or not it will reproduce in New York lakes and in Sunapee lake, N. H., where it has also been planted, is unknown; but it grows rapidly in eastern waters and furnishes good fishing in certain localities. The chinook was acclimated in France many years ago, and Dr. Bellesme, Director of the Trocadéro Aquarium, claims that it reproduces there very freely, and that he has taken eggs from many generations of the fish which have been confined in fresh water. The chinook for Lake Champlain were deposited at Port Kent, Willsboro, Essex, Westport and Port Henry.

LAND LOCKED SALMON.

This salmon has increased greatly in Lake Kora, Hamilton county, where it was introduced by Mr. Timothy L. Woodruff from stock furnished by the United States Bureau of Fisheries. The young feed at the surface and would furnish excellent sport for the fly fishermen. At this time salmon up to five pounds or more are very plentiful in the lake. Land locked salmon have been kept there in water at 68 to 72 degrees near the surface in the month of June without loss.

This species has also been introduced very successfully into Lake Delaware, N. Y., on the estate of Commodore E. T. Gerry.

The land locked salmon eggs received from the Bureau of Fisheries were obtained in part from the Grand lake stream stock, and partly from eggs collected in Branch pond. The fish in Branch pond are of the same blood as those in Green lake. Their eggs are smaller than those from salmon taken in Grand lake stream, and much below the average obtained in Green lake; but they were taken from fish that averaged seven pounds each. The Bureau of Fisheries states that the supply of land locked salmon is not decreasing, but the demand for eggs of that species has in-

creased enormously. In Maine, the results from planting land locked salmon are good, but all of the ponds and lakes are heavily fished.

An examination of some of the tributaries of Lake George was made with special reference to the progress of the experiment of acclimating the land locked salmon. Incidentally, the investigation included West Brook, Northwest Bay brook, and a private hatchery near the village of Lake George. During the stay at Northwest Bay brook a rock obstruction on private property belonging to Mr. Loins was removed with his consent, and thus the principal barrier to the ascent of the salmon to the upper waters of the brook was overcome. The obstruction was dynamited by Mr. Birney Burnett with the result of forming a four-foot clearway for the fish over a rather difficult rapid which has since proved sufficient to enable the salmon to ascend the falls at ordinary stages of water.

Many young salmon, from five inches to eight inches long, were seen in the pools near the falls at a distance of about two and one-half miles from the lake. The presence of these little salmon was known to Mr. W. K. Bixby, of St. Louis and Lake George, who had caught individuals and released them without injury when fly fishing for brook trout. It is almost beyond question that most of the anglers and all of the small boys who fish in the tributaries of Lake George capture and keep many of these salmon, mistaking them for trout. Hardly anyone that we met was able to identify land locked salmon between seven and ten inches in length and the fish were regarded as some kind of trout which could be legally caught. This explains the apparent lack of evidence of the success of our experiment in planting the salmon. A number of large salmon had been caught in the lake; but for some reason anglers who capture the fish are reluctant to make known the fact, and for a long time the propriety of continuing the planting had been questioned. It is highly probable that the salmon is beginning to establish itself in the lake and some of its tributaries, and it is desirable to plant fingerlings in larger numbers. The State has not furnished more than 23,000 fingerlings for Lake George in any one year, and these have been developed from eggs furnished by the United States Bureau of Fisheries.

Photo. R. E. Gooding.

SCRIBA CREEK, CONSTANTIA, 1912. HATCHERY AND PROTECTORS' LAUNCHES.

BROOK TROUT.

Mr. E. S. Casselman took some brook trout eggs in Lake Delaware, N. Y., in the fall of 1911 which were the largest he had ever seen, some of them counting 280 to the fluid ounce.

Considerable mortality has been caused at some stations by gill inflammation due to the presence of a flagellate related to the genus *Costia*. The remedy for this parasite is common salt.

It is not uncommon to lose brook trout fry, as well as fry of other species, through their failure to take liver which is the usual food for young trout, and recourse must be had to some other materials which will tempt their appetite. Mr. Walters, of Cold Spring Harbor Hatchery, has sometimes coaxed the fry to feed upon an emulsion of sand worms. Mr. Redband, at Caledonia, has employed the juices of the freshwater shrimp for a similar purpose, and Mr. Otis, of Upper Saranac, has fed the juices of freshwater clams, *Unio complanatus,* to brook trout fry which had refused to feed.

Overcrowding in hatchery troughs and imperfect preparation of food sometimes causes heavy loss of brook trout through inflammation of the gills and intestines. Trout of the same age held in large fry ponds and fed more carefully have shown no loss. Great care must be exercised in grinding the food and in giving the fish an ample supply of water.

Eggs taken from yearling female trout do not show as good a percentage of fertilization as those obtained from older fish; but the fry produced from eggs of young fish are just as vigorous as those from eggs of older stock.

When trout eggs have reached the age of forty-eight hours they are in a critical stage for railroad transportation. Rough handling has caused very heavy losses which may not be evident until after about two weeks from the time they reach destination. This trouble is obviated when the eggs are accompanied by trained men.

LAKE TROUT.

During an inspection of Lake George, July 11 to 13, 1912, it was learned that professional fishermen had caught a large number of lake trout during the season, and they were still taking

about thirty pounds each daily on some of the fishing grounds. The lake trout were then feeding chiefly upon the little ciscoes, called "frostfish" in that region. This little ciscoe appears to be closely related to the small lake herring of Seneca lake and other New York waters.

The collection of lake trout eggs in Keuka lake usually begins late in November and continues almost to the middle of December. Although this lake contains many of the trout it has never yet furnished a great many eggs. It is said that the spawning beds are greatly depleted by poaching. The yellow perch consumes many thousands of the eggs. On a night in December between 3,000 and 4,000 yellow perch were caught at a single haul of a net on a lake trout spawning bed, and every perch that was examined contained from 150 to 250 trout eggs. When the perch were lifted by the tail the eggs ran out of their mouths. The suckers of Keuka lake also destroy large quantities of trout eggs.

RAINBOW TROUT.

On May 10, 1912, two rainbow trout, eight and nine inches long, were caught in a pound net set for maskalonge in Chautauqua lake where the species was introduced.

Eggs of this trout have been taken as early as October 23 in Virginia, November 15 at Cold Spring Harbor, as late as April at Caledonia, and still later at the Adirondack hatchery.

The rainbow trout rises freely to artificial flies, but it likes best a live minnow or an insect on the surface. A swimming grasshopper is an irresistible bait. The flies preferred are March Brown, Coachman and Brown Hackle, tied on No. 10 Sproat hooks.

STEELHEAD TROUT.

Foreman Henry Davidson has caught four steelheads in Keuka lake up to this time. One of these is now in the office of the Commission. It is probable that many of the fish which have been planted by the Commission are taken by anglers, but not recognized by them because of its similarity to the rainbow trout.

CISCOES.

The whitefishes of New York are at least eight in number of the species, if not more. They include the common whitefish of the Great Lakes and large inland lakes, the frostfish or round whitefish of the Adirondacks, the ciscoes, represented by five or more species differing notably in size, and the tullibee which is abundant in Oneida lake and other large lakes. The ciscoes, or lake herring, are well separated from the frostfish and the common whitefish by their longer jaws, their projecting lower jaw, and their minute eggs. The tullibee is shad-like in form, and has very deep scales. The tullibee is now extensively propagated by artificial methods at the Oneida station of the Conservation Commission. The lake herrings are also reared from eggs secured in the Great Lakes. The whitefish and round whitefish, or frostfish, are developed at the Adirondack hatcheries from eggs taken in Adirondack lakes.

Although the number of the whitefishes is comparatively small in New York, several of the species have more than one common name, and a good deal of confusion arises on this account. The frostfish is a whitefish with very short jaws, small mouth, and the lower jaw decidely shorter than the upper. The ciscoes are very different in their jaw structure, and they are the species which lend themselves most readily to the sport of angling. They will not only take the hook, but they rise freely, at certain times, to the artificial fly. The ciscoe of Hemlock lake, for instance, rises to the surface late in May, when the ephemerae are on the wing and is caught by anglers with the natural mayfly. The late William C. Harris took a few of them with an artificial fly. The anglers go out on the lake to depths of 50 to 100 feet and begin casting with the natural fly. Presently the ciscoes rise from the depths, and in a short time the anglers succeed in taking a goodly number of them.

In Lake George the little ciscoe is wrongly called "frostfish." Some individuals, taken in July by Mr. Birney Burnett, are about 8 inches long, and they represent the favorite size used by anglers in trolling for lake trout on or near the bottom in deep water.

A large ciscoe inhabits a chain of lakes in Washington county, and the Commission has received specimens from Hedges pond which lies north of Cambridge and about 25 miles distant from Troy. Ciscoes also inhabit Canandaigua lake where they are sometimes known as shiners. The shiners, at certain seasons, rise to the surface, and large numbers of them are obtained by shooting into the schools with fine shot. They are used as bait for lake trout. Keuka lake, Hemlock lake, Otisco lake, Skaneateles lake, Geneva lake and perhaps most of the large deep lakes of the State contain ciscoes. These fish are valuable not only as food for the larger game trout, but also for table use.

TULLIBEE.

The tullibee of Oneida lake is rarely seen except during the spawning season in November or during the summer months when the lampreys are preying upon it. Immature individuals are scarce; but about the end of March a tullibee 7 inches long was taken in a net at the west side of the mouth of Scriba creek, Constantia.

The greatest difficulty experienced in collecting tullibee eggs arises from the scarcity of males and the small amount of milt furnished by the male.

The Oneida lake tullibee and other ciscoes can be taken with the hook. The rig used for this kind of fishing includes a flexible wire attached to a line and to a sinker which holds the wire near the bottom. This wire is bent at the free ends at a small angle and each end supports a No. 16 Sproat hook. The eye of the hook is attached to the end of the wire and the leaders are twisted around the wire and run up on the line a short distance. The hooks are baited either with a very small minnow or a small piece of some silvery fish. The locality must be baited for some time until the fish become accustomed to feeding at the spot. A landing net must always be used, as the fish have tender jaws and are not always securely hooked. The fisherman "jiggers" the line pretty constantly because many of the fish do not actually take the hook; but may be impaled upon it if it is kept in motion. In summer the best fishing localities are in the deepest water of the lake.

Photo. R. E. Gooding.

TRANSFERRING PIKE PERCH FROM PENS FOR STRIPPING. CONSTANTIA.

Photo. R. E. Gooding.

TUBS FOR CARRYING PIKE PERCH TO STRIPPING HOUSE. CONSTANTIA.

SMELT.

The smelt are likely to come into the Long Island streams to spawn any time in March. According to Foreman Walters, they appear with a rush and leave as suddenly. Sometimes they do not ascend the creek near the Cold Spring Harbor station until the very night when spawning begins. During some seasons the fish are very small, and again the runs will be composed of very large individuals. In some years great masses of eggs can be scooped up from the creek. The work with this fish is very exhausting as spawning takes place only at night, and the men are kept at work almost every night while the season lasts.

The fry cannot be confined by ordinary screens; they will sometimes escape through bags made of Victoria lawn. The eggs are so extremely adhesive that they must be forced repeatedly through fine screens to break off the footstalk before they will separate in the jars, and even after they have been in the jars for sometime they may stick together in bunches and make it necessary to rub them through screens several times before they will work properly. The process does not appear to hurt the eggs in any way. The percentage of fry from fertilized eggs is very large. For long distance shipments, it is always advisable to send eyed eggs near the hatching point, as the fry soon absorb the yolk sac after they have burst out of the shell.

PIKE.

The Commission is indebted to E. B. Gardner, of Elmira, for the following information about the stocking of Eldridge lake, Chemung county, with pike. Under date of February 11, 1911, he says: "A friend of mine was at Eldridge lake the other day fishing through the ice, and caught a pike weighing five pounds. I had a photograph made of it to send to you. The pike were brought here and put in this lake about 18 years ago by Spencer Mead, who was then superintendent of the N. C. R. R. He brought them from Sodus Bay in cans sunk in the water tank of the engine. A gentleman caught one this fall while casting from the shore with a large minnow. The pike weighed eight pounds. Several have been caught this winter through the ice, but there is so much food in the shape of smaller fish that it is a long time

waiting for these large fish to bite. Maskalonge were planted in this lake in 1912 to help reduce the over supply of minnows.

Dunham's Bay creek, an arm of Lake George, is one of the greatest natural breeding grounds known for the pike, locally called "pickerel" in Lake George. This creek meanders through a level flat for a distance of about three miles. It has numerous short tributary branches and the whole flat is densely covered with the reeds, rushes and other aquatic plants about which the pike deposits its eggs in the early Spring, as soon as the marsh is free from ice. During dry seasons the back flow of water from the lake is insufficient to cover the marshes, and the fish spawn in the creek. The pike of Lake George is an excellent food and game fish and is well worthy of propagation upon a large scale; but its introduction into waters in which it is not native would be a serious mistake. The first attempt of the Commission to hatch pike eggs artificially resulted in the planting of 5,000,000 of fry. Dunham's Bay creek and surrounding marshes should be fully utilized by the Commission as a great nursery for the pike and other fishes. Owing to its habit of spawning early in the Spring in very shallow water just after the ice leaves the lake, it will be easy to collect vast numbers of the eggs. The hatching period is short, and the fish would naturally be distributed as young fry. If the Commission should add this species to its list, the annual output of fish would be enormously increased at very small expense, and it is not likely that this would interfere with the increase of any other fish in the lake, as the pike frequents the shores and the very shallow water.

PICKEREL.

The Commission has many applications for pickerel annually; but it does not propagate this fish and, consequently, does not furnish any for planting.

MASKALONGE.

At the Chautauqua station in 1912 the egg collections exceeded all previous records. Some of the eggs first taken were hatching on May 13th. A quart of eggs is estimated to contain 42,000. The foreman counted 1,312 eggs to the ounce. The first eggs

Photo. R. E. Gooding.

FLOOD SURROUNDING STRIPPING HOUSE, CONSTANTIA, 1912.

were obtained April 27, when three ripe females yielded 168,000 eggs. The last were taken May 11, at which date four gravid females gave 168,000 eggs. The number of fish caught was 2,100, of which 220 were ripe females and 499 ripe males. The total number of eggs secured was 11,046,000. The amount of milt furnished by the males is very small.

In the nets were secured, also, the following fish: Black bass, 193, carp 46, bullheads 1,347, billfish (gars) 55, pike perch 1, (on May 7) rainbow trout 2, (on May 7.) Nine nets were in use.

In exchange for brook trout eggs the Commission gave 400,000 eyed eggs of maskalonge to the Pennsylvania Commissioner of Fisheries.

For the Chautauqua hatchery maskalonge are caught in pound nets set in Chautauqua lake as soon as the ice is out. As the fish are very large and strong, it is best to have two men to hold them. The eggs are pressed out into moist pans, and a very little milt is sufficient to fertilize a great many eggs. The eggs are hatched in glass jars; but as the embryo is too heavy to swim out, the contents of the jars are transferred at the proper time to hatching boxes with a good flow of spring water, or lake water whichever happens to be convenient, and the ends of the boxes are furnished with wire screens to permit an easy flow of water through them. No attempt is made to rear the fish, as they are among the worst cannibals in existence. As soon as they can swim up freely the fry are planted. The fry stand transportation very well. The percentage of fry from green eggs has never been higher than 75, and it is sometimes as low as 60 depending upon water conditions and care in handling. With good lake water such as the maskalonge frequents naturally we should expect not less than 70 per cent. of the green eggs to develop into fish.

TAKE OF EGGS, MASKALONGE AND OTHER FISHES, 1912.

DATE	Eggs		Count	Number fish	Ripe		Bass	Carp	Bullhead	Billfish	Nets fished	Pike perch	Rainbow trout
					Female	Male							
1912	*Qts.*	*Ozs.*											
April 27	4	..	168,000	54	3	8	.....	.....	2	.....	1	.....	.....
28	2	..	84,000	110	2	20	.....	3	500	1	4	.....	.....
29	3	24	157,500	50	5	15	1	4	50	.....	4	.....	.....
30	11	16	483,000	107	3	7	.....	2	10	.....	9	.....	.....
May 1	5	..	210,000	158	7	20	1	1	25	.....	9	.....	.....
2	15	16	651,000	120	16	25	21	3	105	.....	9	.....	.....
3	30	..	1,260,000	175	21	40	20	2	65	.....	9	.....	.....
4	28	24	1,207,500	174	19	40	22	7	63	2	9	.....	.....
5	25	24	1,081,500	206	27	62	14	1	102	2	9	.....	.....
6	26	..	1,092,000	146	26	57	25	.....	200	2	9	.....	.....
7	48	16	2,037,000	235	38	70	20	9	125	2	9	1	2
8	29	8	1,228,500	217	23	50	23	4	48	4	9	.....	.....
9	17	..	714,000	137	14	50	7	2	20	17	7	.....	.....
10	12	..	504,000	158	12	25	18	7	10	20	9	.....	.....
11	4	..	168,000	53	4	10	21	1	22	5	9	.....	.....
Total	263	..	11,046,000	2,100	220	499	193	46	1,347	55	.....	1	2

42,000 eggs to quart; 1,312½ eggs to ounce.

Photo. R. E. Gooding.

HAULING TRAP NET WITH PIKE PERCH. CONSTANTIA, 1912.

Photo. R. E. Gooding.

HAULING TRAP NET WITH PIKE PERCH. CONSTANTIA, 1912.

PIKEPERCH.

On May 6, 1912, a pikeperch weighing 5 or 6 pounds was taken in a pound net in Chautauqua lake. The number of fish of this species thus far taken in our nets at Bemus Point is insignificant compared with the number of fry planted in the lake.

In the season of 1912, at the Oneida station, 54,782 pikeperch were caught for the hatchery. The number of females stripped was 2,796, and the number of males 32,998. This fish usually begins to spawn about April 7th at Constantia; but on April 15, 1912, only 300 of the fish had come into Scriba creek and they were mostly males. The spawning run was about 10 days late.

The female can readily be distinguished in the water by its larger size, and by the fact that several males are always in attendance upon each female. In the natural spawning the female rushes up towards the surface but does not come out of the water, and therefore, the process has not been photographed. The males dart around the female with fluttering motions, discharging their milt while the female emits her eggs. After a short time the female drops to the bottom followed by the males.

The method of collecting eggs in the stripping house is as follows: The spawntaker holds the female in his left hand, taking a firm grip around the tail and pressing the head under his elbow. Gloves are worn and they are kept constantly wet. A number of males are first stripped into a large, moist, wooden bowl, and then the eggs are added and thoroughly mingled with the milt, the object being to place the eggs immediately into an ample quantity of milt. One operator continues to strip the males, so that all of the eggs, as they are pressed from the female become surrounded quickly with milt. During the process of stripping the eggs and milt, the tail of the fish is used to stir the mixture of the two elements in the bowl. A bunch of feathers is also used for gently stirring the two products together. Only a gentle pressure is applied to the males and females, as it is not desirable to force out either eggs or milt not fully matured.

When a sufficient quantity of eggs has been taken in the bowl, a little water is added, and the eggs are allowed to remain in the milted mixture until they feel hard when taken up by the fingers.

From time to time a portion of the milted liquor is poured off and replaced with clean water, meanwhile the eggs and milt are continually stirred with bunches of feathers until as many eggs as possible have become fertilized. In the course of 50 minutes to one hour or longer the eggs which are beautiful, golden in color, show plainly in the clear water, and their tendency to stick together which is so strong at first, is entirely overcome. The process of separating the eggs has sometimes been finished in 50 minutes, and sometimes it has continued an hour and one-half. When properly prepared for the hatching jars the eggs are carried in tubs in a liberal quantity of water to the hatching house where they are transferred to the jars and the circulation of water, which must be continuous, is begun. Eggs properly hardened may be shipped by express in egg cases for considerable distances, and with small loss. They must, however, be unpacked and separated in tubs of water before they are placed in the hatching apparatus. At the Oneida hatchery the estimate of eggs to a quart is 130,000; but some authorities find 150,000.

The hatching period varies greatly, but is usually from 18 to 20 days at a water temperature of about 48 degrees. The longest hatching period observed at Constantia was 36 days. The shortest record for the incubation is seven days; but this did not occur at Constantia. The preponderance of males among the pikeperch is remarkable. On one occasion, the milt of 200 males was used in fertilizing the eggs from 43 females.

During the 5-year period ending in May, 1912, the total number of pikeperch planted by the Commission in tributaries of the St. Lawrence river, in St. Lawrence county, was 11,175,000. All of these were placed in waters from which they could descend into the St. Lawrence river, and this probably explains the increase and spread of the pikeperch in the region.

BLUE PIKE.

On May 23, 1912, a case of eggs of the blue pike, taken in Lake Erie, were received from the Pennsylvania Commission of Fisheries. The fry resulting from these eggs were planted in the lake.

Photo. R. E. Gooding.

TAKING PIKE PERCH EGGS. CONSTANTIA, 1912.

SMALL MOUTHED BASS.

The spawning of the bass has been retarded by Mr. Dwight Lydell, in Michigan, by herding the fish in comparatively small, deep ponds having no spawning beds, shoal margins or suitable bottoms for spawning. In this way all danger of the destruction of eggs by cold weather is avoided. Serious losses of eggs have occurred through the recurrence of cold weather after a warm spell had induced spawning.

During an inspection of the waters of Lake George, July 11 to 13, 1912, Commissioner Fleming and the writer examined the spawning beds of black bass and saw some of the nests which had recently been occupied by the young fish. Only two of the nests observed were guarded by parent bass. On all the other nests the young bass were schooling independently and showed their ability to protect themselves. The two nests guarded by parent fish were in deep, cold water. It may be possible that the late spawners are usually those that inhabit such portions of the lake. This investigation furnishes a basis for the belief that the nesting season of the black bass in Lake George is practically finished by the middle of July.

Dallas Flannigan, Esq., of New York city, states that Paradox lake contains small mouthed black bass in large numbers as well as a few trout. The bass are small and large ones are rarely taken. This condition has been observed for more than fifteen years, and the absence of large bass is hard to understand. Mr. Flannigan suggests that perhaps the fish have been interbreeding for so long a time that they have degenerated and need new blood. In the first place, nature planted trout in Pyramid lake and not bass. Perhaps the bass can never thrive there. The struggle for supremacy between two species of predaceous fish such as these might go against one or the other or both of the contestants. Both prey upon other fish; but the brook trout is not solely a fish eater. A large part of its food consists of insects and their larvae, worms, mollusks and crustaceans. If the bass had not been in competition with the brook trout it is almost certain that the latter would have held its own and would have increased in the lake.

S. E. Filkins, Esq., of Medina, N. Y., reports that one of the best bass fishing grounds known in Lake Ontario is located due

north of Medina inside of the Shadigee bar. Numerous nests have been found between the bar and the shore, extending to a distance of about one-third of a mile east and west.

Yearling black bass are sometimes attacked at Constantia by a flagellate of the genus *Costia* which produces intense redness of the gills and a bluish mould on the region behind the head. They are liable, also, to injury from a parasitic worm whose larvae become encysted under the outer skin and form black specks similar to those caused by a distome in the brook trout of certain lakes. This condition of parasitism is especially noted in the Adirondack region where the bass interfere so greatly with the welfare of the trout. According to Dr. Charles C. Trembley, of Saranac lake, it has become necessary to construct dams and screens for trout lakes to prevent the bass from making their way into trout waters. The Lower, Upper and Middle Saranacs, once the most beautiful of trout lakes, are no longer famous for trout, and Long Pond, Hoel pond, Turtle and Slang pond will soon follow unless dams are built, and indeed it may already be too late. Moose pond would have gone long ago had the doctor not kept it dammed and screened except for overflow.

One of the worst enemies of the black bass in ponds is the common eel, the young of which find their way through the supply pipes and perhaps by crawling around obstructions through the wet grass.

One of the best natural foods for black bass at the Linlithgo station is the larva of a species of black fly, *Simulium venustum,* according to Professor Johansen, of Orono, Maine, to whom specimens were sent by Professor S. A. Forbes, at our request, for examination. This larva is a ferocious biter and it is believed that some of the cases of poisoning observed among employees of the station were due to this insect. Another species of Simulium found at the Linlithgo station and forming an important part of the natural food supply of the young bass has been identified by Professor Charles A. Hart, systematic entomologist, Urbana, Ill., as the Buffalo gnat *S. pictipes.* The growth of the bass fingerlings has been very greatly hastened by the larvae mentioned. These larvae collect in great numbers on the slashboards of the outlet screen, and the young fish will take them very freely from

Photo. R. E. Gooding.

Dip net Fishing at night for Pike perch. Constantia, 1912.

the hands of the employees. Another extremely important food for the little bass is the river herring, the fry of which are reared during the shad season. These fry do not last very long, but they are very much appreciated by the bass in their early stages of growth.

SILVER BASS.

This fish is more generally known as white bass. It is a near relative of the striped bass of our sea coasts. It may readily be distinguished by its lengthwise blackish streaks on the sides. These streaks are eight or more in number. The body is deeper than in the striped bass, and more compressed. The general color is silvery, tinged with gold on the sides.

The white bass abounds in the Great Lakes region. In Oneida lake the Conservation Commission collected more than 700 of the fish while gathering black bass for its breeding ponds at Constantia. The fish has been introduced into many lakes in which it was not native. The species prefers the deeper parts of rivers and is also well adapted for lakes and ponds. It is said to be a good fish for artificial pond culture. The spawning season is in April and May. It spawns near the shores or in the river mouths.

This bass swims in schools while feeding or migrating, and thus becomes a ready prey to the angler. It is caught with the artificial fly or with a minnow, and it will bite freely in the night. One hundred white bass have frequently been caught in a few hours. This bass feeds naturally upon minnows, crayfish and other freshwater crustacea, small mollusks and the young of fishes. A white bass one foot long will weigh about one pound. In the Ouachita river, Arkansas, it is said to reach the weight of five pounds. This is one of the best of the food and game fishes, and the Commission hopes to propagate it in large numbers when the proper pond facilities are available.

SEA BASS.

Foreman Charles H. Walters had great difficulty in confining the newly hatched fry. He found that they would go through wire cloths with thirty-two wires per inch. The eggs are so light that they slop over the top of the floating boxes when the sea runs high.

TOMCOD.

On February 29, 1912, Foreman Walters reported that the tomcod eggs were in the jars sixty-one days at Cold Spring Harbor before they hatched. These eggs usually hatch in from twenty-seven to thirty-five days. The delay was due to extremely cold weather.

BLUE CRAB.

In Doctor Hay's paper "A Life History of the Blue Crab," it is stated that three years are probably required for the young crab to attain its full growth. The young shed the shell twice each summer before they reach full size. In Chesapeake bay, Dr. Hay thinks it probable that the growth of the young crab is more rapid, and that it may reach its full size in two seasons at most. At Crisfield, Md., the spring catch, beginning in May, contains great numbers of small crabs from 1½ to 2 inches across. In June they have reached 3 inches, and in July 4 inches. In August and September most of the females have reached a breadth of 5 inches and are mature and ready for mating. Dr. Hay states that this gradual increase in the size of individuals taken does not prove such a rapid growth as the previous statement might indicate. The duration of life of the crab after it has reached maturity is not positively known, but it has been given as seven years.

Very large individuals of the common edible crab are found in Shinnecock Bay; but it is reported that they are becoming scarce. Foreman Walters has liberated many adults at the end of August in Cold Spring Harbor which were carrying great numbers of eggs nearly ready to hatch. Some of the eggs, under a magnifying glass, showed the embryo moving very distinctly.

CYCLOPS.

In the early spring of 1912, Mr. E. S. Casselman, at Lake Delaware, found *Cyclops* very abundant in the lake, and found it to be excellent food for trout fry. He collected this crustacean through the water supply in the hatchery in considerable quantities while the water taken near the ice had a temperature of 35 degrees Fahr. He found that by dropping a pipe and taking water from the bottom of the lake in a dense growth of grass he could obtain immense numbers of *Cyclops*.

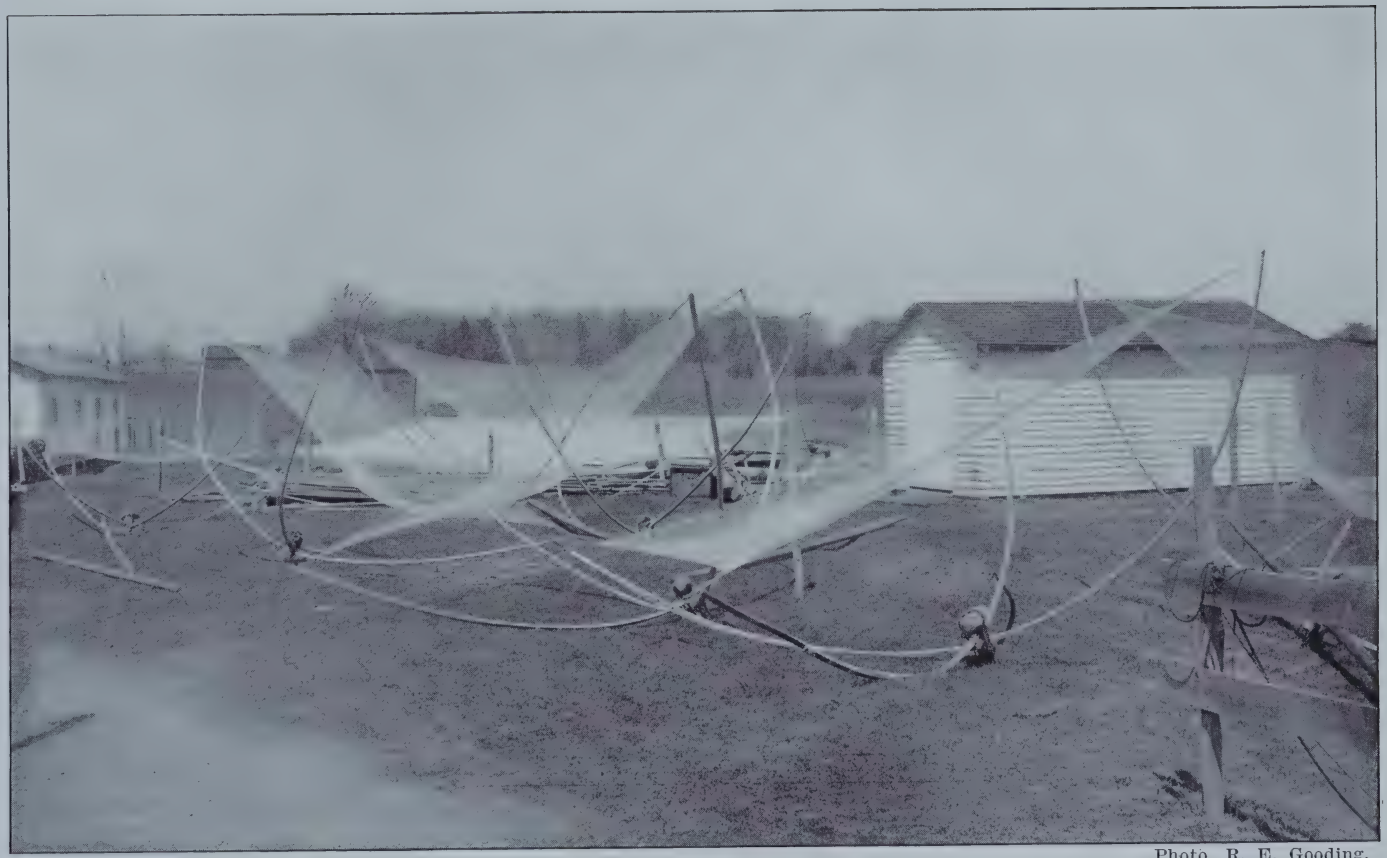

Photo. R. E. Gooding.

Drying Dipnets. Constantia, 1912.

THE SNOW FLEA.

In early spring, Foreman Davidson finds in the head troughs at the Bath Hatchery enormous numbers of snow fleas. This is one of the spring-tails, or podurans, which are found on the snow. The common snow flea of the United States is *Achoreutes nivicola*, and it often appears in great numbers. This insect is sometimes a pest where maple sugar is made. The jumping of this flea is accomplished by means of stiff hairs on its under part. The flea can probably do no harm to the trout, and may serve as food for them.

FISH FOOD.

The following species of shells taken from stomachs of whitefish from Canandaigua Lake, N. Y., were identified by Professor W. N. Rankin, of Princeton University:

Amnicola limosa (Say)
Valvata tricarinata (Say)
Pisidium abditum? (?)

The Amnicolas were by far the most abundant of the shells. The largest individual of the genus *Pisidium* is about one eighth of an inch in length. The other shells are very much smaller.

A former Fish Commissioner of Vermont, Mr. D. D. Thomas, writes of trout food as follows:

> "In September I commenced using ground meat mixed with what is called Red Dog flour, which is undoubtedly the same as you call mill middlings. I used one part of meat to five parts of flour. This flour costs 1½ cents per pound. The results are more than satisfactory. If you give it a trial, you will be pleased, not only in the great saving of expense, but also in the health of adult trout. I was at the Minnesota State Hatchery at St. Paul in September and Mr. Fullerton told me he was using the same food with good results."

Of course, this mixture was cooked in the same way followed in preparing Lane's Food and other mixtures of meal and meat.

FISH ENEMIES.

An examination of the Lamprey work in Oneida Lake shows the extent of the destruction of food and game fish by that para-

site. The lamprey, usually in July and August, attacks whitefish, lake herring, bullheads, pikeperch, suckers and other fish for the purpose of sucking out their blood. This seems to be a requirement for the proper development of the eggs of the female, and it has caused enormous losses of good fish in New York lakes, and especially in Oneida Lake. The only means available for the prevention of this loss is the capture of the lamprey in weirs and other fishing apparatus during its ascent of streams in which it spawns, and the destruction of the larval lampreys in the mud and sand shoals near the mouths and along the banks of creeks tributary to the lake. The larvae furnish excellent bait for the larger game fish, and many thousands of them are so employed. The Commission might profitably devote some money and effort to the further diminution of this pest which is one of the worst enemies of food fish in Oneida Lake.

At the Chautauqua Station a shitepoke (a species of heron) destroyed a number of brook trout before it was captured and destroyed. The crow blackbird was also frequently observed capturing trout in the cement ponds outside of the hatchery building, and many of the birds were killed to protect the fish.

A watersnake, locally known as the black watersnake, was found at the Caledonia Station after it had completely swallowed a ten inch brown trout which was fully two inches deep. The snake was three feet long and only one inch in greatest diameter in its normal condition.

Inquiries have been made as to the best means of keeping frogs out of fish ponds. To do this for large ponds would involve considerable expense, but small springs and rearing ponds can readily be inclosed so as to keep out these animals entirely. A tight board fence, slightly inclined outward, and with a perfectly smooth surface, raised to a height of 2½ or 3 feet, will accomplish the object, or the fence might be made of galvanized iron in which case it should be kept well painted and quite smooth.

TROUT PARASITES.

Foreman Annin collected in a Catskill Mountain Lake some brook trout which contained worm larvae in the muscle layers near

the backbone. Upon dissection he found in a number of the fish either a grub or a long white worm. Specimens were sent to the office for examination. These larvae appear to represent one of the broad flatworms.

COST OF TROUT.

The actual cost of fry and fingerling trout at the stations of the Commission is not very easy to estimate because a large part of the maintenance fund each year is devoted to repairs and improvements which may benefit the station for a term of years; but a fair idea may be obtained by comparing the results accomplished at two of the stations in the same year. One station which spent $7,000 distributed 2,435,613 trout, chiefly brook trout and more than one-half of them of fingerling age. The other station, not so favorably situated with regard to natural advantages, expended $5,000 and furnished 730,100 trout, of which 430,100 were fingerlings. The cost of trout at the first station was three mills each and at the second one six mills each, giving an average cost of four and one-half mills per trout. This, of course, is far below the market value of trout at commercial hatcheries. It should be kept in mind that few of our stations have a brood stock of trout and most of our eggs are bought in the eyed stage from commercial hatcheries.

TROUT PLANTING.

It is a very common practice with applicants for trout to send in a large number of requests for fish for the same stream. In most cases all of the applicants ask to have trout delivered at the same railroad station. This is not only unnecessary but it involves a great waste of time and fish provided the requests were granted in full. As a matter of fact the Commission does not undertake to supply more than 500 fingerling trout for each mile of the length of the stream to be stocked. The Federal Bureau of Fisheries has fixed a still lower limit, namely, 400 fingerlings to the mile. This is based upon the fact that the average trout stream does not contain food enough for a greater number of trout than the limit decided upon. It would be much better for appli-

cants in all cases to observe this necessary rule, for in so doing they will save a great outlay of time in the office of the Commission as well as at the stations which provide the fish. All applications involve records which are permanently kept and which cannot be overburdened through unnecessary requests. The Commission will always endeavor to send a number of fish suitable to the stream or lake for which application is made, and will do this preferably upon a single application. Secretaries of clubs and associations interested in the welfare of the waters should take pains to comply with this necessary regulation.

EXAMINATION OF WATERS.

The following description of Oquaga Lake, in Broome county, was contributed by George B. Curtiss, Esq., of Binghamton:

> "This lake is situate on a mountain four miles above the village of Deposit in this county; is about 1,800 feet above sea level, surrounded almost entirely by heavy timber, fed by a large number of never failing springs. The water is very clear and cold, in the deepest places about 150 feet deep and averaging nearly 60 feet all over the lake. It is three miles around, measured on the ice, and has a small outlet which empties into the Delaware river two and one-half miles below. Two hotels are located there and about 35 cottages. During the summer time there are probably between 400 and 500 people there. Originally it was full of native brook trout which have disappeared. About 30 years ago lake trout were put in. I have been informed that these were planted by Seth Green. Four years ago the first successful fishing for lake trout resulted in the capture of 22 trout in three weeks that were large enough to save. One weighed 12 pounds, another which I caught, 9¾ pounds, one 9½, one 8, one 7 and others smaller. There are two kinds of trout in the lake, one the ordinary lake trout with white meat while the other has red meat. Out of 11 which I caught in 1908 7 were of the latter type. The fact that all sizes were caught shows that they are breeding and thriving well."

FISH EXHIBITIONS.

At the Sportsmens' Show in New York city, March 1 to 9, 1912, the following live fish were shown:

Maskalonge, from Bemus Point.

Brown trout, adult, from Caledonia.

Brook trout yearlings, from Bath.

Lake trout, three years old, from Bath.

Pikeperch, catfish, bullheads, buckeye shiners, minnows, lawyer and mud puppy from Constantia.

Short-nosed sturgeon, small mouthed black bass and large mouthed black bass from Linlithgo.

Chain pickerel, banded pickerel, white perch, yellow perch, brook trout adult, rainbow trout adult and marine killies from Long Island.

The fish were exhibited in nine aquarium tanks eight of which were about three feet long, and the largest one nearly six feet. The water was not clear, and the equipment for circulation was imperfect; but no losses occurred except in transportation from Linlithgo, Bath and Long Island. If the Commission exhibits live fish at the Sportsmen's Show in future, the management should furnish much better facilities and a better location. The big maskalonge was successfully transported from Chautauqua Lake in a tank 4 inches shorter than the fish, and was safely transferred to the New York Aquarium after the close of the show. The exhibition was remarkably successful and attractive.

At the State Fair, at Syracuse, the Commission displayed a variety of food and game fishes which were obtained in Oneida Lake and at all of the other hatcheries except Cold Spring Harbor. The water supply was very much improved over that of last year. At the close of the fair the fish remaining alive were delivered to William Dunk, chairman of the propagation committee of the Anglers' Association of Onondaga, and they were planted by him on September 15, 1912, in the following waters:

Application.	Water stocked.	Kind of fish.	Hatchery.
45026.....	Onondaga lake.....	21 miscellaneous adults.....	Oneida.
45027.....	Jamesville reservoir..	20 black bass fingerlings.....	Oneida.
45028.....	Jamesville reservoir..	10 black bass adults.....	Oneida.
45029.....	Swamp brook.....	10 brook trout adults.....	Fulton Chain.
45030.....	Swamp brook.....	12 brook trout adults.....	Adirondack.
45031.....	Geddes brook.....	3 brook trout adults.....	Adirondack.

Application.	Water stocked.	Kind of fish.	Hatchery.
45032.....	Geddes brook.....	44 brook trout fingerlings....	Adirondack.
45033.....	Geddes brook.....	100 brook trout fingerlings....	Chautauqua.
45034.....	Geddes brook.....	17 brook trout adults.....	Delaware.
45035.....	Nine Mile creek.....	2 brown trout adults.....	Bath.
45036.....	Limestone creek.....	3 rainbow trout adults.....	Bath.
45037.....	Onondaga lake.....	4 shortnosed sturgeon.....	Linlithgo.
45038.....	Butternut creek.....	29 rainbow trout adults.....	Caledonia.
45039.....	Limestone creek.....	26 rainbow trout adults.....	Caledonia.
45040.....	Butternut creek.....	50 rainbow trout fingerlings..	Caledonia.
45041.....	Onondaga creek.....	47 brown trout adults.....	Caledonia.
45042.....	Butternut creek.....	50 brown trout adults.....	Caledonia.
45043.....	Butternut creek.....	23 brown trout adults.....	Caledonia.

LONG ISLAND FISHERY STATISTICS.

The traffic manager of the Long Island Railroad Company, Mr. A. L. Langdon, stated in a letter that there was a decrease in fish shipments over the lines of that company during the years 1910 and 1911, and that the decrease was principally in shipments of weakfish and flukes from Montauk and Promised Land. The fish shipped from those points are caught in Gardiner's bay, Napeague Bay and Block Island Sound. The shortage of fluke marketed was not due to a scarcity of the fish; the fish were abundant, but the prices were so low at certain times that it did not pay the fishermen to catch them.

Weakfish are migratory, and their spawning grounds around Long Island have not yet been discovered, so that the Commission has been unable to increase the supply by artificial hatching. Flukes have not yet been propagated at the Long Island Station; but the winter flounder is distributed in very large numbers.

DISINFECTION OF PONDS.

Copper sulphate solution has been used in the Spring Reservoir Pond at Cold Spring Harbor to kill bacteria and protozoan parasites which seemed to infest that pond. Mr. Walters wrote that the solution had killed everything in the pond, and that he expected to give it another treatment and to follow this with a strong solution of common salt. Salt is fatal to the flagellate related to *Cosita* which has caused extensive gill inflammation in the young brook trout. The copper sulphate, according to Mr. Walters, has not been effective in keeping down the excessive growth of algae.

COURTESIES.

The Commission is indebted to Hon. George M. Bowers, Commissioner of Fisheries, Washington, D. C., for blueprints of the Put-in Bay Station, Lake Erie, showing the pump and water supply system of that great Federal hatchery. He has also furnished plans of the U. S. Hatchery at Mammoth Spring, Arkansas.

The Pennsylvania Fish Commission, through Commissioner N. R. Buller, has presented 1,800,000 shad fry for planting in the Hudson river from our Linlithgo station.

The New York Aquarium has continued to transfer to the State fry and fingerlings of various kinds of fish which have been developed from eggs in that institution, and the fish thus secured have been planted in public waters.

The Southside Sportsmen's Club of Long Island, through its president, Mr. George P. Slade, has again permitted employees of the Commission to collect eggs of brook trout in ponds of the club. The eggs obtained from this source were among the best developed in our hatcheries.

To Mr. S. D. Coykendall, president of the Cornell Steamboat Company, the Commission is indebted for the privilege of taking brook trout eggs in Alder Lake for the use of the hatcheries at Linlithgo and Margaretville.

Mr. E. C. Brown, of Copake, N. Y., permitted Foreman Rhines to collect eggs of yellow perch in his private waters for development at the Linlithgo station.

The Commission is very greatly aided in its work of stocking the public waters by the railroad companies which provide free transportation for its messengers and cans of fish. This liberal policy increases greatly the facilities of the Commission for increasing the supply of food and game fish for the people.

A pair of tullibees from Oneida Lake was presented to the U. S. National Museum, Washington, D. C. Collections of fishes were made at Constantia for Professor W. M. Smallwood, of Syracuse University.

The Commission made an unusually fine display of live fish from various parts of the State at the Sportsmen's Show in New York city in March, 1912. Notwithstanding the severity of the

winter and the unfavorable weather conditions prevailing the exhibit was the most successful one we have ever made at that place. At the close of the show the fish were shipped to the New York Aquarium. Among the fishes exhibited was a maskalonge 43 inches long which was transported from Chautauqua Lake.

A display of live fish was made at the State Fair at Syracuse under more favorable conditions than heretofore as far as the water supply was concerned. Some large trout were sent to the Cobleskill Fair from the Delaware Hatchery.

Respectfully submitted,

TARLETON H. BEAN,

Fish Culturist.

Albany, N. Y., November 30, 1912.

APPENDIX TO ANNUAL REPORT

OF

DIVISION OF FISH AND GAME

BREEDING MALLARD DUCKS FOR PROFIT

BY

W. T. HORNADAY AND LEE S. CRANDALL

BREEDING MALLARD DUCKS FOR PROFIT

By W. T. Hornaday and Lee S. Crandall

In endeavoring to supply, at short notice, the need of the State Conservation Commission for a paper on the breeding of mallard ducks, we do not advance the idea that we think we know *all* that there is to know about this subject. On the contrary, we regard the subject as one in which much remains to be discovered by those who propose to rear ducks on a commercial basis; and we offer only what we have learned in the New York Zoological Park by duck-breeding which was not done on a cash-producing basis. In the breeding of ducks for park purposes, our Bird Department has been very successful; and we now offer, for the benefit of the public, the results of our experience. We must also add that it is physically impossible for us to amplify these notes through the laborious channel of correspondence.

Of all American ducks the common Mallard (*Anas platyrhynchos*) is the most persistent and successful breeder. It quickly becomes accustomed to captivity, it enjoys park life, and when given even half a chance, it will breed and rear its young. Its nearest relative, the Black Duck *(Anas rubripes)* is of similar size and desirability as a food duck, but its difference in temperament is a serious obstacle to its propagation on a commercial basis. The black duck is more nervous and shy than the mallard, and its breeding is too easily interrupted.

Unquestionably, the mallard duck can be reared in captivity in numbers limited only by the extent of breeder's facilities. The amount of net profit that can be realized depends wholly upon the business acumen and judgment displayed in the management of the flock. The total amount of knowledge necessary to success is not so very great; but at the same time, the exercise of a fair amount of intelligence, and also careful diligence, is absolutely necessary. Naturally, the care and food of the flock must not cost extravagantly, or the profits will inevitably disappear.

THE POND.

Fortunately for mallard breeding, an elaborate or costly plant is not necessary. The three things that are absolutely indispensible are a pond, a bit of meadow, and a certain amount of brush-covered ground, or a tract of rank grass.

The main reason for the pond is obvious — to keep the birds clean and in good health. Any farm that is traversed by a running brook is eligible for duck-farming operations. In case a pond does not exist, one can easily be made. A large pond will last a long time without being emptied and cleaned; but if the pond must be a small one, then the owner should establish it on such a basis that it can easily be emptied and thoroughly cleaned. For a small pond, the ideal bottom is one covered with concrete, so that the work of cleaning is rendered both easy and effective. If a pond has a gravelly bottom, it does not require any concrete; but a bottom of black earth, or swamp muck, should be paved in some manner, at the earliest moment. In constructing a pond for aquatic birds or mammals, its bottom should slope toward the outlet in such a manner that when the outlet is opened, the entire area will be quickly drained.

So long as the water in a pond can be kept reasonably clean, it will support a really large population of ducks. Although we never have tested the matter, we believe that in commercial duck-raising it will be sufficient to allow two square yards (18 square feet) of water surface to each duck. Thus a pond 100 feet square would be sufficient for 555 ducks. It is to be carefully noted, however, that the water is to be kept reasonably clean; which means that a deep layer of excretions must not be allowed to accumulate on the bottom. It is understood that rarely, if ever, will all the ducks of a flock occupy the pond at the same time.

After the pond has been formed, the next step is to plant a large portion of the enclosure with thick cover, the most suitable plants for the purpose being willows, privet, etc. If plenty of tangled brush is provided, mallards will nest freely on the ground in sheltered nooks. It is always well, however, to supply a number of bottomless boxes about 15 inches square, laid on the ground, with an opening near the bottom large enough to permit the entrance of the bird.

If a natural pond or lakelet exists, of many acres in extent, an attempt should be made to induce the growth of various aquatic plants suitable for duck-food, such as wild celery (*Vallisneria*), wild rice (*Zizania*), duck weed (*Lemna*) and pond-weed (*Potamogeton*). If the pond is very small, or the number of ducks large, such plants will not be able to hold their own, and their introduction will be a waste of time. Of course in ponds that are periodically emptied and cleaned, plant life is impossible. In such cases, green food in some form must be provided, such as finely chopped fresh grass, cabbage or lettuce.

BREEDING STOCK.

And now as to the breeding stock. Pure wild birds can be obtained from any of the reliable dealers in live water-fowl, at prices ranging from three dollars to five dollars per pair, according to the season and the supply. Stock can be obtained of Wenz & Mackensen, Yardley, Pa.; G. D. Tilley, Darien, Conn.; J. W. Whealton, Chincoteague Island, Va.; Cecil French, Washington, D. C.; K. C. Beck & Company, Hutchinson, Kansas, and others.

If the pond and its enclosure is small, one drake to three or four ducks is sufficient. If the pond is of good size, one drake to two ducks is a safer proportion.

When the birds arrive, they should be confined for at least a day or two in a dry enclosure, until they have recovered from the effects of the journey, and are feeding well. When several days have been spent in transit, the quarantine must be of longer duration. Then, if they are already pinioned, they may be turned upon the pond. In case they are not pinioned, two courses are open. If it is nearly breeding time, the wings should simply be clipped, and the birds liberated, to be caught and pinioned *after* the laying season. Pinioning at this time might so upset the birds as to very materially affect their laying. If the nesting season is not at hand, the birds should be pinioned at once.

PINIONING.

Pinioning is desirable and necessary to keep mallards from flying away; also to render it possible to catch them easily. The

process is very simple, easily performed, and almost invariably successful. A careful study of the accompanying illustrations will make detailed explanations unnecessary. The ninth and tenth primary wing feathers, counting from the outside, should be removed, together with their "coverts," and the small feathers which clothe the wing at the point of insertion of the primaries. A tight ligature of stout, uncolored twine should then be tied about the wing, as close as possible to the junction with the thumb or bastard wing, on the side toward the tip. The ligature must be tight, a good knot for the purpose being shown in the illustration. The skin over the bone is severed, and the bone is then cut through, cleanly and evenly, at a point about a quarter of an inch beyond the ligature. The best instrument for this purpose is a strong pair of gardener's pruning shears, costing 75 cents. After the operation the bird may be returned to the water at once. If the operation has been properly performed, small loss of blood and none of life is to be feared.

FOOD.

The birds should be fed once or twice daily on a mixture of wheat, buckwheat and barley, a little cracked corn being added during cold weather. Any soft food is eaten greedily, but there is no advantage to be gained by feeding it to healthy birds. Green food, also, should be given, as described above.

During the winter months, no shelter is required unless the weather be exceedingly severe. If the number of ducks is fairly large, they will keep open a place in the ice by their constant swimming; but if they fail to do this, the ice must be cut for them. It is open water that enables waterfowl to keep their feet from freezing. If the temperature is very low, or the flock small, it will be necessary to open a hole in the ice at least once daily. It is a simple matter to erect low shelters of brush or straw to break the wind, if needed; but no houses of any kind are necessary.

If the duck yard is specially exposed to the full sweep of the piercingly cold western and northwestern winds or our northern winter, then it will be well to erect, as a wind screen, a tight board fence six feet in height, along the western side of the duck enclosure.

BREEDING.

We know of but one profitable method to be followed in rearing the young. A few ducklings can be brought to maturity by allowing the duck to hatch and rear her own brood, but the losses from exposure and lack of regular and proper food make this method uncertain and impractical. When the ducks begin laying, great care must be taken not to disturb them. The eggs should be collected daily by the same person, and set under small hens, or placed in incubators. During the period of incubation, the eggs must be sprinkled frequently with warm water, to keep them sufficiently moist.

CARE OF DUCKLINGS.

For the first twenty-four hours after hatching, the ducklings require no food or water. On the second day they should be placed in a brooder, or removed, with the hen that hatched them, to a dry, shady run, as nearly as possible impervious to vermin and cats. If natural shade is not sufficiently abundant, an artificial substitute must be provided. Temporary shade can be secured by stretching burlap on wooden frames. If possible every runway should be well carpeted with short, tender grass of which the young birds will consume a great quantity. At first the food of ducklings should consist of a soft mixture of meals, such as is supplied by Spratts' Patent and other concerns. If this be not available, an efficient substitute may be made by mixing equal parts of middlings, barley meal and beef scraps, or crissel. The food should be scalded, mixed, and served as a crumbly mass, but not sloppy; and it should be doled out in small quantities at frequent intervals. Fine grit should be supplied in the form of clean sand or similar material. If the range be sufficiently large, the ducklings will add a great number of earthworms and insects to the menu.

Inasmuch as young ducklings should be reared away from the pond, pure water for drinking purposes should be supplied; and its depth should never exceed one inch. Convenient vessels for this purpose are sold by all poultry supply houses. Great care must be taken to prevent the water from becoming heated by exposure to the sun's rays.

When about one week old, all the young birds should be pinioned by removing the tip of one wing, the incision being made at a point about one-eighth inch beyond the thumb, as fully described and illustrated for adults. For ducklings, however, no ligature is required, as there is no bleeding. The wound may be dusted with some good antiseptic powder, such as xeroform, to prevent blowing by flies.

At the age of about six or seven weeks, the food of ducklings may be gradually changed to small grain. At this time, also, they may be turned upon the pond; and when they have become thoroughly accustomed to the grain, they may well be considered as safely reared.

ENEMIES.

Undoubtedly, the worst enemies of young ducklings are cats and rats. Cats are sly robbers, hard to detect, and their abundance in a semi-wild state is increasing yearly. All wandering cats should be killed. Rats are determined and bloodthirsty vermin, and often they work for some time before their depredations are discovered. Cats, rats, mink and weasels must be kept down by means of traps, guns, and poison if necessary.

Crows will greedily take small ducklings, and eggs; and sharp-shinned and Cooper's hawks are ever ready to carry off the young birds. Snapping turtles, and such fish as pike, pickerel, and bass, if allowed to live in a duck pond, will seize and devour a great many ducklings, and even attack the adult birds. All such aquatic scourges must be carefully kept out of duck-ponds.

MARKETING THE SURPLUS.

The New York market always desires mallard ducks that can legally be sold and served, and it always will. The prospects are that the extra value attaching to the mallard on the bill-of-fare will make the raising of mallards much more profitable to the breeder than the rearing of the common domestic duck. Breeders should count upon disposing of their stock through the game and poultry dealers of New York, Albany, Buffalo and other large cities, because the hotels and restaurants of the cities are the natural consumers of high-priced meats.

All preserve-bred mallard and black ducks must be killed and officially tagged in accordance with the regulations of the State Conservation Commission. Breeders can depend upon it that a very little trouble on their part will suffice to place all these operations on a thoroughly practical and sensible working basis. It is not possible for preserve-bred ducks to be killed by shooting when they are to be sold as food, because every large duck-pond, well populated with mallard ducks, attract annually a certain number of wild ducks which under no circumstances can be shot according to the law, and marketed. Preserve-bred ducks must be caught and killed by hand; and pinioning renders this easily possible.

There are a few persons who claim that it is unsportsmanlike to kill a mallard duck "by hand;" but to this we reply that it is ten times more unsportsmanlike to shoot tame, preserve-bred mallards as they fly from their coops to their pond!

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